REPORT RESUMES

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OUT-OF-CLASS PROGRAMED INSTRUCTION COMPARED WITH CONVENTIONAL HOMEWORK ASSIGNMENTS IN TEACHING EXPOSITORY WRITING IN FRESHMAN ENGLISH.

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THE EFFECTIVENESS OF PROGRAMED PRESENTATION OF THE ENGLISH LANGUAGE WAS COMPARED TO CONVENTIONAL WORK ASSIGNMENTS. EXPERIMENTAL AND CONTROL GROUPS CONSISTED OF 273 FRESHMAN STUDENTS WHO WERE RANDOMLY DISTRIBUTED IN 12 ENGLISH SECTIONS. THEY ATTENDED REGULAR CLASSES BUT RECEIVED DIFFERENT OUT-OF-CLASS TREATMENTS. ALL SUBJECTS WERE TESTED DURING THREE PERIODS OF THE STUDY--PRETESTING, POST-TESTING, AND RETENTION. SPECIALLY CONSTRUCTED TESTS AND QUESTIONNAIRES WERE ALSO INCLUDED. TREATMENT OF DATA COLLECTED WAS BY ANALYSIS OF VARIANCE AND COVARIANCE. THE MAJOR CONCLUSIONS INDICATED THAT THE PROGRAMED PRESENTATION WAS NOT BETTER THAN THE CONVENTIONAL ASSIGNMENTS, THAT EXPERIMENTAL SUBJECTS DID AS WELL AS THE CONTROL SUBJECTS, AND THAT EXPERIMENTAL SUBJECTS SPENT LESS TIME WITH THEIR WORK. FUTURE RESEARCH IS SUGGESTED TO DISCOVER THE CONDITIONS UNDER WHICH TRANSFER OF CONTENT OCCURS AND TO IDENTIFY THE OPERATIONAL FACTORS THROUGH WHICH TRANSFER HAPPENS. PROGRAMS SHOULD BE DEVELOPED IN ALL ASPECTS OF ENGLISH LANGUAGE FOR USE AT COLLEGE AND UNIVERSITY LEVELS. (RS)

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OUT-OF-CLASS PROGRAMED INSTRUCTION COMPARED WITH CONVENTIONAL HOMEWORK ASSIGNMENTS IN TEACHING EXPOSITORY WRITING IN FRESHMAN ENGLISH

Cooperative Research Project No. 1750

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PREFACE

The project which we are about to report on represents the joint efforts of many people. Without their splendid cooperation, our own efforts would have been to no avail. Therefore, a fervent and hearty thank you go to all our personnel.

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CHAPTER I

INTRODUCTION - CONTEXT FOR PROJECT 1750

Summary of Context

The following report presents a description of procedures, the results of findings, and the interpretation of findings for Project 1750, an experimental research study aimed at exploring a possible method for making the college freshman English course more nearly effective in teaching students to write clear, useful expository prose. The study centered on the out-of-class use by subjects of a linear, constructed answer, overt response program designed to demonstrate some of the important expository functions of written English.

The particular problem upon which this study was focused, that is, the attempt to find a way to help the student improve his ability to write expository prose, makes up one aspect of a more complex problem stemming from the present realities of American civilization, and confronting American education with certain demands that must be met by the schools, colleges, and universities.

Problem

American civilization, as it is experienced at this point in the twentieth century, comes strongly marked with technology. The roots of this blossoming lie, probably, somewhere in the industrial revolution that germinated in the eighteenth century;

when!

but the present fact has taken a shape and a direction of growth that could not have been predicted at the outset. And it seems likely that the technological strain in American culture will continue to develop for a long time to come because Americans evidently consider their technology as something of value. The increasing status and recognition given to engineers and physical scientists attest to this attitude. The space flights of American astronauts, aside from what they may in themselves mean, are certainly symbols of pride and triumph for Americans, visible signs that technology works and that it is a good thing. A successful flight is followed by official recognition in high places and by enthusiastic public acclamation.

But a developing technology brings with it some rather special problems. A technology so vast and so complex requires more and more people with diverse and highly specialized skills and knowledge to maintain it. Many people must cooperate in complex and integrated efforts to produce a single complex result. One consequence of this general requirement is the need for qualified personnel, and this consequence is making itself felt as an acute pressure upon the entire system of American education. Secondary schools and universities are enrolling students in ever increasing numbers; students who demand precise, accurate knowledge (Stolurow, 1961). Skinner has pointed out (1958) that this demand cannot be met simply by increasing the number of school buildings and the number of teachers. Teaching, says

Skinner (1958) must become more efficient. Clearly, American schools, colleges and universities are faced with the problem of producing highly educated individuals (for that is what American civilization increasingly demands) under conditions of mass instruction (for those are the conditions that rapidly increasing enrollments force upon the schools).

The contradictory nature of the problem makes for difficulties in every discipline, both in the secondary schools and in the colleges and universities. In practical terms, the, or at least a, solution seems to lie in finding one or more methods that make it possible for the instructor to spend his time in the classroom most creatively, and that allow the student to spend his time in such a way that he gets a maximum return for the energy he invests in study.

During the last ten years, attempts to realize the creative use of the instructor's time and the economical use of the student's time have included the use of movies, television, electromagnetic tapes, and film strips as adjuncts to classroom teaching (Barlow, 1958). These methods, techniques and devices have been used in efforts to find some way to reconcile the need for a high degree of individual education with the unavoidable conditions of large class enrollments. Efforts to effect a solution to the problem have tended increasingly toward experimentation with the technique of the "teaching machine," or "programed learning," or "programed instruction," as the technique is synonymously called (Holland, 1960).

The high degree of interest in programed instruction is not difficult to explain in the light of claims made for the method by responsible investigators. These claims are perhaps best summarized by B. F. Skinner (1958) who maintains that programed instruction approximates several of the desirable features of the tutorial situation: (a) there is a constant interaction between the program and the student, as there is between the tutor and the student, (b) the program (presented through the medium of a machine) insists, as does the tutor, that each point be understood by the student before he goes on to the next one, (c) the program, like the tutor, presents exactly the material that the student is ready for at each point, (d) the program, like the tutor, helps the student to find the right answer through logical sequencing and prompts, and (e) the program, like the wise tutor, reinforces the student at each step for the right answer. To the extent that these claims prove valid, programed instruction offers one possible solution to the problem of dealing with large numbers of students so that the instructor maintains his creative role in the classroom, and so that each student individually gets precise and accurate information in the area of study he pursues. If a program can be devised to present even a part of the material of a course that otherwise must be carefully taught by the instructor, then the instructor is freed for more creative activity in the conduct of his classes. If a program can be devised to approximate the values of a tutorial, then the student gets a maximum return for the time and energy he spends working with it in his periods of study.

The technique of programed instruction has been tried in several disciplines with programs designed for presentation at different age and academic levels (Rigney and Fry , 1961). In a typical situation, the program is used as an adjunct to the classroom teaching of the subject matter of a discipline. In such cases, each student in the class uses in his own time the program prepared for the course, usually in lieu of conventional kinds of homework, and the instructor takes up in class where the program leaves off. Evidence from pilot studies and experimental studies indicates that programed presentations tend to be successful, and that they do teach (Schramm, 1962). Programed instruction seems to offer possible help toward solving the problem of providing precise, accurate, specialized education.

But specialized education, even in the advanced phases provided by college classrooms and laboratories, is not enough. A technological civilization depends upon cooperative effort, since no one person can master all of the necessary details of every necessary discipline. Consequently, the kind of cooperation vital to the complicated efforts of many people depends upon clear and accurate exchange of information. But if all any one person knows is his own special discipline, he is not in a position to exchange information with any other person outside his area of competence, and so, he is unable to cooperate fully with others in a concerted, complex effort.

It becomes necessary, then, for everyone to have and to be able to exercise a mastery of some common symbolic system outside his own special discipline, and this system must be capable of transmitting all information necessary to cooperative social, cultural and technical effort. The most useful, most complete and most flexible symbolic system available for these purposes is language---and that means, for Americans, their own native English

Now the process of acquiring a mastery of one's own native language is itself very complicated; the activities begin almost with birth, and their workings--many of them--remain obscure. The process is never complete for any particular person; it simply begins soon after birth and ends with death. Some workings of the process, however, are open to investigation, are describable, and in some important sense, are controlable. Some aspects of what constitutes the mastery of a language are teachable and learnable in deliberate, conscious ways. Among these aspects, fortunately, can be counted the uses of a language for the exchange of information. And these are the very uses that can best be taught in the schools and universities, particularly the uses that might be described as "expository prose," or "expository writing." If students can be taught to write clear, useful expository prose, then they will be well on the way toward mastering an aspect of their language that will allow for the exchange of information between specialized disciplines.

Imparting this competence to students is the usual aim of college and university freshman English courses.

Yet, it is becoming more and more clear that the college freshman English course is generally not succeeding very well at realizing its objective (Steinberg, 1963). In view of the aims of this course in most colleges and universities, and in view of the large, and increasing, size of entering freshman classes, the need for a solution to the problem of maintaining the instructor's creative role and of giving each student individually the precise and accurate information he must have is becoming critical. Programed instruction, a technique that apparently gets results in other disciplines, has received but scant attention in connection with the problems of freshman English. Rigney and Fry (1961) list only one program in the English language designed at this level. Meanwhile, traditional attacks upon the problem apparently yield small results.

The freshman English course at most institutions forms the basis for most of the writing that the student will do during his college or university career. Except for advanced composition courses, usually offered as electives, the freshman English course forms the basis for what the student learns about the expository uses of his language--that is, the uses of English for transmitting information. In many institutions, freshman English includes instruction in grammar, sentence construction, paragraph development, and extended composition, assigned and graded by the instructor. In addition, the course customarily includes readings in expository prose and in the fundamental literary forms of lyric poetry, fiction, and drama. The reading is assigned by the same instructor who teaches the grammar and composition, and the reading is discussed by the class under his direction. This instructor also examines the class on the readings and grades the examinations. The aim of such a course is to produce in the student a competence in the expository use of English so that he will be able to perform literately not only in English courses, but in all courses that require extended, connected composition in the English language. The hope is that his literacy will remain with the student after graduation.

But in order to teach the freshman English course successfully, as that course is now organized and presented at most American colleges and universities, it is necessary for each instructor to have small classes; that is, classes of ten, not more than fifteen students. Yet, the almost yearly increase in the number of entering freshmen in colleges and universities makes this limit on class size impossible. Freshman English is everywhere a required course. As a result, instructors are faced with large numbers of students in their classes, students with diverse secondary school training, and with a course to teach them that is designed only for a small number of students at a time, and students with an assumed homogeneous linguistic preparation. It takes an experienced instructor 33 hours to grade 200 compositions, the best rate that even a good theme grader can maintain (Diederich, 1960). At the rate of ten minutes a composition, every student added to the instructor's class takes his toll in hours for theme grading over a semester. The added time necessary for conferences with students about their work is not so easily calculated. And to the burden of more compositions to read and grade, and more conferences to hold, the instructor must add the increase of his time used for grading grammar assignments and examinations on the readings. It becomes increasingly difficult for the instructor to find the time to maintain a high creative level of teaching in his classroom. It becomes increasingly difficult for the student to keep himself working hard at the job of learning to read and write when his knowledge of results is cursory--not because the instructor is incompetent, but because the size of the class makes a full discussion of individual results impossible in the short time available.

Clearly, freshman English at the college and university level is an area in which the use of programed instruction deserves to be examined thoroughly as a promising way to free the instructor of some of his burden of handling increased numbers of students, and as a way of encouraging the individual student to keep working with reasonable diligence. Some parts of grammar, and some information about the expository use of English can be programed as an aid both to the instructor and to the student. Project 1750 represents an attempt by the investigators to construct such a program, and to use it in an extended, experimental situation.

Objectives

The chief objective of Project 1750 was to determine the effectiveness of a program in the expository use of the English language, used to accompany regular classroom instruction, compared to conventional out-of-class assignments given to freshman college and university students. Gain and retention scores on standardized tests (described in Chapter II-Method) were used as criteria of effectiveness. Treatment given to subjects in Control Group 2 (indicated in Chapter II-Method) represents, in this study, "conventional out-of-class assignments."

Hypothesis and Questions

To set the direction of the study, the following hypothesis was tested:

> Students will learn the expository use of the English language better through out-of-class programed instruction than through conventional out-of-class assignments.

In addition to testing the hypothesis, the study sought to answer the following questions:

1. Do students with differing verbal aptitudes achieve better through out-of-class programed instruction than through conventional out-of-class assignments?
2. Do students who have worked with the program retain their knowledge of the expository use of the English language better than students who were given conventional out-of-class assignments?

Other Related Research

Limited studies have been conducted with programs in some aspect of English, based for the most part on samples drawn from Junior High School and High School populations. Meyers (1960) has described the results of an initial test of a Junior High School Vocabulary Program, reporting in full detail the behavior of the subjects in the trial. Kolhepp (1961) conducted a survey by questionnaire to assess the attitudes of teachers toward the programed text English 2600, which these teachers had been using with 7th through 12th grade children. Teachers' attitudes were favorable, but the effectiveness of the text was not ascertained. More recently, a controlled study, based on English 2600 was conducted in five High Schools in the Denver Public School System at the 10th grade level (Reed and Hayman, 1962). Results from this study, in which the programed text was introduced into classroom procedures in the experimental groups, indicate no difference in learning (as measured by gain scores) between experimental and control groups, but suggest that students with higher verbal aptitudes tend to respond better to programed instruction than do students whose verbal aptitude is relatively low.

These studies are interesting, especially for the questions they suggest, but they tend to be tentative and exploratory, and the results seem provisional.

In disciplines other than English, however, several studies suggest that students learn, and learn faster, through programed instruction than through more traditional methods.

With a program designed to teach some aspects of German Composition, Ferster and Sapon (1958) report that students learned an amount of German in 27.5 hours comparable to the amount of German presented in 96 hours of a first semester course taught in the conventional way. A more recent experiment, designed to teach combat soldiers enough Russian to obtain tactical information from newly captured prisoners of war, furnishes data (from a pilot study) suggesting that machine teaching, without human instructors, can probably produce limited foreign language skills (Rocklyn, Moren, and Zinovieff, 1962).

In disciplines other than Language, some studies seem to indicate that programed materials can be successfully used. Roe, _et_. _al_. (1960), in their University of California (Los Angeles) experiment with automated teaching methods report that freshman students in a course in Elementary Probability not only learned faster, but better (as measured by criterion tests) through programed instruction than students did through more conventional kinds of instruction. Jacobson (1962) reports similar results for The Hamilton College Experiments with programed instruction in Mathematics, Modern Languages, Logic and Psychology.[1]

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[1] Jacobson confines the details of his report to the program in Logic, with which he was involved.

Several studies have been made to explore the relationship between individual intellectual aptitude and performance in programed instruction situations, and the data reported seem to suggest that a significant interaction might be found between aptitude level and programing. Nothing about such interactions has been established conclusively (Stolurow, 1961) although one of the findings in the Denver Public School System study seems to point to such a connection.

While experiments with programed instruction in disciplines other than English indicate that programed presentations are effective as primary teaching instruments, and while some exploratory studies in English point in promising directions, no study of the kind reported here for Project 1750 has come to the attention of the investigators. Much still remains to be done toward establishing the uses of programed instruction for College and University English courses.

Operational Definitions

Term		Definition
Score on STEP-Writing Test	-	Scaled (converted) score.
Score on STEP-Essay Test	-	Sum of two independent ratings of the same essay; each independent rating extends from 1 (low) to 7 (high).
Score on Themes #4 and #6	-	Sum of two independent ratings on the same theme; each independent rating extends from 1 (low) to 7 (high).
Score on Program Test	-	Number of correct responses (Refer to Appendix G).
Score on Handbook Test	-	Number of correct responses (Refer to Appendix H).
Pretest	-	Test given at the beginning of the fall semester 1962.
Posttest	-	Test given toward the end of the fall semester 1962.
Retention Test	-	Test given toward the end of the spring semester 1963.
Gain Score	-	Score on posttest minus score on pretest.
Retention Score	-	Score on retention test minus score on posttest.
Verbal Aptitude	-	Verbal subscore of the College Board Scholastic Aptitude Test (SAT-V).
Better	-	Significantly higher (.05 level) statistics: gain scores, retention scores, and correlation coefficients.
Conventional Out-of-class Assignments	-	Treatment given to subjects in Control Group 2 (Chapter II, page17).
Criterion Frame	-	Frame in which the expected response calls for an application of the information in a set to a particular example.

CHAPTER II

METHOD

Summary of Method

The population for Project 1750 consisted of the 1962 entering freshman class at Fairleigh Dickinson University, Teaneck, New Jersey. From this class, the subjects were randomly selected and distributed into 12 freshman English sections. Four freshman English instructors, cooperating in the project study were each assigned three of these sections; one experimental group, and two control groups. Teacher Aides were assigned in pairs to each instructor to help him handle homework assignments and to read the regularly assigned themes. All subjects attended regular class sessions and were given similar in-class treatment. The out-of-class treatment (that is, the "homework" assignments) consisted of work with the programed presentation for the experimental groups, work with a standard workbook for one set of control groups, and work with a standard handbook for the other set of control groups. All subjects were given standardized pretests, posttests, and follow-up retention tests. Four specially trained readers read the pre, post, and retention STEP-Essays (Cooperative Test Division, Educational Testing Service, 1957a, 1957b). All subjects wrote 10 expository essays during the semester to a set of common theme specifications. The primary statistical methods used to process the data for the study were analysis of variance, and correlational analysis.

Design

Sampling

The incoming 1962 freshman class at Fairleigh Dickinson University, Teaneck, New Jersey, about 500 students, represented a cross section of the socio-economic groups in the New York Metropolitan Area, ranging from the lower middle to the lower upper class (Warner, W. L. et.al., Social Class in America, 1949), In educational background and college preparation, these students represented a cross section of graduates from the public high schools in the same area. From this entering freshman class, 273 students, randomly assigned to freshman English sections, were selected as subjects for the project study.

Distribution of Subjects

The students comprising the sample were randomly distributed into 12 freshman English sections, each section consisting of about 23 students. Four freshman English instructors, cooperating in the study, each had three sample sections assigned to him, of which one was an experimental group and two were control groups. Each instructor administered similar in-class treatment for each kind of group. The out-of-class treatment for each kind of group is indicated below:

KIND OF GROUP	TREATMENT
Experimental	Students worked, during the first semester, on the program The Expository Use of the English Language. They had access to the standard handbook[1] for the course for optional use as reference.
Control 1.	Students worked with assignments in the required workbook.[2] They had access to the standard handbook for the course for optional use as reference.
Control 2.	Students worked with assignments in the standard handbook[1] for the course. They were also free to make optional use of the handbook.

The order of treatment was randomly latinized for each instructor. The workbook assignments from Control Groups 1 and the handbook assignments from Control Groups 2 were corrected by Teacher Aides, a pair of whom were assigned to each instructor. The project directors and staff, not the individual instructors, scheduled all out-of-class assignments, and designed them, so far as possible, so that the content of the workbook and handbook exercises paralleled the content of the programed presentation being used by the experimental groups. The handbook and the workbook used in the project study both fall within the range of standard texts for college and university freshman English courses, but neither had ever been used before at Fairleigh Dickinson University.

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[1] Guth, Hans P., Words and Ideas, A Handbook for College Writing, San Francisco, Wadsworth Publishing Co., Inc., 1959.

[2] Guth, Hans P., Introductory College English, Form A, New York, Holt, Inc., 1959.

In order to insure that the relevant variable examined was not how much students study outside of class, but what they studied, experimental subjects were required to complete a specified number of frames each week, and control subjects did a comparable amount of homework each week.

The rationale for this design was to control, as much as possible, two possible major sources of variation: teacher personality and the "Hawthorne effect." The workbook used by subjects in Control 1 groups was assumed to represent the "special" out-of-class treatment, comparable to the program worked on by the experimental subjects. In order to attempt some control over the other vitiating variable--instructor bias in favor of, or against programed instruction--the investigators held conferences with the cooperating instructors prior to, and during the study.

At the beginning of the study, (fall semester, 1962), the subjects in the 12 sections were distributed among instructors and treatment groups, as shown below:

TABLE 1

Distribution of Subjects by Instructors and Treatment Groups

Treatment Group[a]	Instructor 1	2	3	4	Total
C1	23	23	17	23	86
C2	22	24	26	21	93
E	22	25	24	23	94
Total	67	72	67	67	273

[a]C1 = Control Group 1
C2 = Control Group 2
E = Experimental Group

While the class enrollments included one section with 17 students, and one section with 26 students, the class size for most sections fell within the limits 22-24 (see Table 1). The point of greater importance, however, is that the total number of students for each instructor was approximately the same, and the total number of subjects in each kind of treatment group was approximately equivalent (see Table 1).

Between the end of the fall '62 semester and the end of the spring '63 semester, 30 subjects dropped out of the study, either because they had to repeat English 1 (N = 10), or because they left the university (N = 20). This attrition reduced the number of subjects for whom retention scores could be gathered to 243. Their distribution among treatment groups was as follows:

Experimental	84
Control 1	80
Control 2	79

At the end of the spring semester, while the total number of subjects had been reduced to 243, the number of students in each treatment group had remained nearly equivalent.

Measurements

Primary data yielded by the design for Project 1750 consisted of responses to the program, gathered from subjects in the experimental groups, and of scores made by all subjects on a battery of pretests, posttests, and follow-up retention tests. Response tapes from subjects in the experimental sections were analyzed for error rates and mean times. Results of responses on the pre, post, and retention tests were statistically treated and compared as gain and retention scores, respectively. The instruments for gathering the primary data (described in the following section: Research Instruments) consisted of the program, The Expository Use of the English Language, and two kinds of standardized tests: (1) ETS Coop STEP-Writing Test, form 1A and 1B; (2) ETS Coop STEP-Essay, forms 1A, 1B, and 1D. The verbal subscore of the College Board Scholastic Aptitude Test was used as the measure of verbal aptitude. The scores were made available by the university Records Office.

In addition to the standardized tests, a series of special tests and questionnaires (described in the following section: Research Instruments) were constructed and administered to the subjects in order to gather corollary data and information. The results yielded by these special instruments were also treated statistically.

Research Instruments

The chief research instruments for Project 1750 consisted of (1) the program, The Expository Use of the English Language; (2) standardized ETS Coop STEP Tests; (3) special tests and questionnaires.

The Program

The Expository Use of the English Language is a programed presentation of some of the expository functions of English, developed at Fairleigh Dickinson University by D. C. Rowland and J. E. Tohtz during 1960-61 and 1961-62. This presentation is a linear, constructed answer, overt response program consisting of 1514 frames. Construction of frames is based on the principle of controlled response; sequencing of frames is based on the principles of gradual, progressive, incremental steps. The order in which the units of the program follow each other is determined by a logical view of the development of the subject matter. The whole program is designed to teach some of the important functions of the English language when it is written to present information or to report facts. This is the program that subjects in the experimental groups worked with.

The Expository Use of the English Language was used in pilot studies (1960-61) on the Teaneck campus, and the data indicated that students do learn from programed presentations. One pilot study group that had worked through a section of the program in the fall semester, 1961, on recognition of the English sentence showed, as a group, fewer sentence fragments and comma splices in their writing at the end of the semester than groups that had not used the program. The authors have constantly revised the program in the light of student responses, and a final revision was made, based on answer tapes from a pilot group in the spring semester, 1962, before the study reported here began.

STEP Tests

Two kinds of standardized tests were used to measure gain and retention scores within and among the treatment groups: (1) Cooperative Sequential Tests of Educational Progress (STEP)-

Writing, and (2) Cooperative Sequential Tests of Educational Progress (STEP)-Essay. Both kinds of tests were developed by the Educational Testing Service, Princeton, New Jersey (Cooperative Test Division, Educational Testing Service, 1957a and 1957b).

STEP-Writing Test

The STEP-Writing Test, available in two alternate, equivalent forms, was administered to all subjects in the study as pretest (Form 1A), posttest (Form 1B), and follow-up retention test (Form 1A). Both forms of this test were designed to assess the full range of skills used in the process of good writing. The committee of specialists responsible for the STEP-Writing Tests felt that a truly comprehensive test should go beyond the limits of the emphasis usually placed only on logical organization and mechanics of expression. Consequently, the content validity of the STEP-Writing Test is based on the following categories (Cooperative Test Division, Educational Testing Service, 1957a, p.9.):

1. Organization. Reasonable ordering of ideas, events, facts, etc.
2. Conventions. Attention to syntax or sentence structure, diction in the sense of gross errors of word choice, punctuation, and spelling.
3. Critical thinking. Detection of unstated assumptions, perception of cause-and-effect relationships, and anticipation of the needs of the reader.
4. Effectiveness. Adequacy of emphasis, adequacy of development, exactness of expression, economy, simplicity, and variety.
5. Appropriateness. Choice of a level of usage suitable to purpose and reader; i.e., using the right "tone" and appropriate diction and employing tact where desirable.

Estimated reliability for STEP-Writing Test, form 1A, based on internal consistency, is $r = .74$ ($N = 98$), (Technical Report, Cooperative Sequential Tests of Educational Progress, Cooperative Test Division, Table 1, p.10, Educational Testing Service, Princeton, N. J., 1957). Reliability of the STEP-Writing Tests, based on scores made by subjects in Project 1750 is as follows: Test-retest with alternate forms 1A and 1B, interval of 16 weeks, is $r = 0.60$ ($p < .001$)($N = 243$).

The STEP-Writing Test furnishes a measure of one meaning of the term "learn the expository use of English better"; that is, the ability to distinguish degrees of effectiveness and appropriateness in a piece of expository prose that is presented for examination. The STEP-Writing Test measures essentially the editorial skill of the reader.

But another important aim of the study was to find a way to help the student improve his ability to write original expository prose, which is not necessarily the same thing as being able to recognize a good or a bad piece of writing which somebody else has produced. Another, and very important meaning of the term "learn the expository use of English better" is the ability of the student to demonstrate that he can, in fact, produce a piece of writing himself that shows improvement over his earlier examples. In order to measure this meaning, the directors and staff administered the STEP-Essays to all subjects in the study.

STEP-Essay Test

The STEP-Essay Test, available in three alternate, equivalent forms, was, like the STEP-Writing Test, administered to all subjects as pretest (Form 1A), posttest (Form 1B) and as follow-up retention test (Form 1D). All forms of the Essay Test are designed to get from the student an original piece of expository prose. The student is presented with a brief statement of the topic he is to write about, and he is given 35 minutes to read the explanatory statement and execute his piece of writing. The content validity of all forms of the Essay Test is based upon the scoring of the student's performance in comparison with papers on the same topic written by other students--papers which have already been rated by committees of "experts" (Cooperative Test Division, Educational Testing Service, 1957b, p. 3.). The test handbook records the following intra-rater reliabilities (Table 8, p. 29.):

STEP-Essay

Form 1A r = 0.50 (N = 197)
Form 1B r = 0.51 (N = 220)
Form 1D r = 0.63 (N = 223)

STEP-Essay specimens, written by subjects in this study, were scored (rated) by four specially trained readers in a scale from 1 (low) to 7 (high) according to the instructions for scoring included in the Handbook for Essay Tests (Cooperative Test Division, Educational Testing Service, 1957b). At each of the three testing periods, these readers were rotated among the four instructors in order to minimize the "halo effect." Each essay was rated independently by two readers. The score on the

STEP-Essay is the sum of two independent ratings. The ratings of these readers, based on the performance of the subjects, furnish data for two measures of reliability: (1) Inter-rater reliability, and (2) Intra-rater reliability for STEP-Essay Form 1A.

Inter-Rater Reliability. Data for inter-rater reliability appear below in Table 2.

TABLE 2

Inter-Rater Reliabilities for STEP-Essays
Forms 1A, 1B, and 1D

	STEP-Essay Form 1A	1B	1D
N	273	273	243
r	0.51**	0.29*	0.41**

* significantly different from zero at $p > .01$
** significantly different from zero at $p > .001$

All reliability coefficients are significantly different from zero (see Table 2), and they are all of the usual magnitude reported for studies of essay ratings by independent readers. The correlation coefficient for Form 1B, however, (see Table 2) is comparatively low at 0.29. In interviews with the project directors, the four readers unanimously reported that they had found the Form 1B essay difficult to score because the wording of the explanatory statement for the handling of the topic was, in their view, ambiguous; and they were each faced with the necessity of interpreting key words before they could decide whether or not a student had performed the assignment. Since they made their interpretations without conference with the directors, and without discussion among themselves, their decisions, arrived at independently, apparently widened the margins within which each reader applied the instructions for scoring.

Intra-Rater Reliability STEP-Essay, Form 1A. Data for intra-rater reliabilities were collected for each of the four readers, but for only one form (Form 1A) of the STEP-Essay Test. Results appear in the following table:

TABLE 3

Intra-Rater Reliabilities for STEP-Essays Form 1A

Rater	N	r	P
H	25	.82	$<.01$
U	25	.72	$<.01$
S	25	.73	$<.01$
R	25	.81	$<.01$
Average	25	.77	$<.01$

The correlation coefficients in Table 3 are based on rating scores recorded by each of the four readers for 25 Form 1A STEP Essays. These papers were selected at random from the pretest essays already read once by these readers, and resubmitted for a second reading after an interval of 10 weeks. The r coefficient for each reader, and the average (0.77) for all readers, indicate a high degree of consistency in the intra-ratings of the STEP-

Essays, Form 1A,as used in this project (see Table 3).

Special Tests and Questionnaires

In addition to the programed presentation, the STEP-Writing Test and the STEP-Essay Test, all used for gathering the primary data for this study, the following series of special instruments were constructed and administered in order to gather collateral data and information useful for interpreting the major results of the project: (1) Test on the Program, (2) Test on the Handbook, (3) Study Preference Inventory, and (4) Student Questionnaire.

Test on the Program[1]

To discover if the students in the experimental groups had, in fact, learned the content of The Expository Use of the English Language, the project directors abstracted 30 criterion frames, requiring a total of 58 constructed answer responses, from the 34 sets of the program, and administered this sequence to all subjects in the study after the experimental subjects had completed work with the program. Subjects in the control groups were included in this testing in order to establish a base line. After an interval of 18 weeks, the test was administered again, but this time only to 55 subjects randomly selected from the experimental groups. Test-retest reliability was $r = .87$, $p <.001$ ($N = 55$).

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[1] A specimen of the Test on the Program is included in Appendix G.

Test on the Handbook[2]

Within the limits of the design for this study, all subjects in each kind of group were permitted optional use of the standard handbook (Guth, *Words and Ideas*); that is, all subjects were free to consult the index and pages of the handbook at any time and in whatever way seemed best to them. This option extended to the subjects in Control Group 2 who also did regular assignments in the book.

Since conscientious use of the handbook could, possibly, produce some effect on the quality of a student's theme writing, it seemed desirable to have an indication of the extent to which the students exercised their option. The project directors together with the Research Assistant in English and a Research Assistant in Psychology accordingly constructed a 50 item, four option, multiple choice test, based on sections in the handbook that were listed in the theme specifications during the semester as optional readings. Reliability for this test, based on internal consistency, was $r = .66$ ($N = 273$), $p < .001$.

Since all subjects had free access to the handbook, and since the test was based only on suggested readings common to all subjects, the results of the test indicated only what might be expected from minimal independent use of the book by the students. Within the terms of the research design, possible maximum use of the book could not be measured.

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[2] A specimen of the Test on the Handbook is included in Appendix H. This test was constructed by Mr. Maucie S. Miller, Jr., Research Assistant in English, and Mrs. Marion Turpen, Research Assistant in Psychology.

Study Preference Inventory[3]

Because of the nature of this research study, it seemed interesting and potentially useful to the directors to collect data from the subjects that would indicate their personal preferences for ways of studying, and that would indicate something of their study habits. Such data could possibly prove useful in correlating the performance of subjects in the experimental groups, using a linear program for homework, with their study habits and preferred study methods. The object was to discover, if possible, some of the personality traits or behavioral habits that sort well with good performance in programed instruction. To gather such data, a special questionnaire, the Study Preference Inventory, was constructed and administered to all of the freshman class.

The Study Preference Inventory (SPI) is a forced-choice questionnaire consisting of 26 pairs of statements. One item of each pair denotes a study method which is in line with the principles and characteristics that underlie extrinsic programed instruction (especially as presented by a teaching machine); the other item represents a conventional study method.

The validity of the questionnaire is based on the informed opinion of persons qualified to make the required judgments. Seven specialists in programed instruction were asked independently to indicate which item of each pair of the 26 pairs of statements represented a study method similar to some aspect of programed instruction. On 13 items, all of the judges agreed. On 11 items, only one judge disagreed, and on the remaining two items, two judges disagreed with the opinions of their colleagues.

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[3] This inventory was developed by Mrs. Marion Herzog, a graduate student in Psychology at Fairleigh Dickinson University, under the guidance of the project directors. A specimen of the Study Preference Inventory is included in Appendix F.

The Study Preference Inventory was readministered, after a two-week interval, to 100 subjects in the project. Consistency of responses ranged from 69% to 100%, with a mean consistency of 88% and a median consistency of 94%.

Student Questionnaire[4]

As a result of informal interviews conducted with about 20% of the subjects, the directors of the project constructed a questionnaire that aimed at eliciting the opinions of the subjects on several aspects of the study. The project directors felt that such a questionnaire would furnish information of a kind that would provide a perspective on the study from the subjects' point of view. This questionnaire was made chiefly to get at the subjects' reactions to Teacher Aides (who scored their written work and held conferences with them); the subjects' reactions to the program (used in the experimental groups); and to get the subjects' opinions about the usefulness of the theme specifications. The questionnaire further invited the subjects' comments on and criticisms of the project they were taking part in, and asked for suggestions they cared to offer for improving subsequent studies.

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[4] A specimen of the Student Questionnaire is included in Appendix E.

Testing Schedule

Measurement instruments for the entire project were administered to subjects according to the following schedule (Table 4):

TABLE 4

Testing Schedule

	Test	Date Given	Where Given
Pretest	STEP-Writing 1A	9/15/62	Gym - all subjects together
	STEP-Essay 1A	9/17-18/62	In class - each section individually
Posttest	STEP-Writing 1B	1/5/63	Gym - all subjects together
	STEP-Essay 1B	1/3-4/63	In class - each section individually
	Test on Program	1/7-8/63	In class - each section individually
	Test on Handbook	1/9-10/63	In class - each section individually
Retention Test	STEP-Writing 1A	5/11/63	Gym - all subjects together
	STEP-Essay 1D	4/24-25/63	In class - each section individually
	Retest on Program	5/17/63	Project Office
Student Questionnaire		1/5/63	Gym - all subjects together
Study Preference Inventory		11/29/62	Gym - all subjects together

Procedure

Project 1750, extending over a one year period from August 1, 1962 through July 31, 1963, was divided into three operational phases: (1) Preliminary Planning Stage, (2) Experimental Stage, and (3) Data Analysis and Concluding Stage.

Preliminary Planning Stage

During the Preliminary Planning Stage, the investigators recruited and trained personnel, and made all provisions for implementing the research design for the study.

The subjects, by agreement with the responsible officials of Fairleigh Dickinson University, were selected from the incoming freshman class, 1962, at the Teaneck Campus, Teaneck, New Jersey. With the cooperation of the Department of English on that campus, the selected subjects were scheduled and distributed to meet the requirements of the design for the study, and every effort was made to keep class enrollments in every project section as nearly equal as possible.

The Department of English, in consultation with the investigators, assigned four instructors to the project as cooperating members. No instructor was assigned without his consent nor without the prior approval of the investigators. In meetings with the instructors, the investigators acquainted them with the objectives and design of the study, and explained to them that each instructor was to administer similar in-class treatment to each of the three treatment groups under his classroom jurisdiction. The plan for out-of-class treatment, different for each treatment group, was understood to be the responsibility of the investigators, and the instructors agreed to act under their direction in making out-of-class assignments.

The investigators then met with the Research Assistant in English, previously selected and already familiar with the plan for the study. He undertook the job of making the syllabus for all out-of-class work, coordinating the material in the program, the workbook and the handbook so that subjects in all three treatment groups would be doing similar work with similar concepts at the same time. He also assumed responsibility for constructing the common theme specifications, keyed to the syllabus, and designed to form the basis for all out-of-class writing assignments for all subjects in the study.

Since the four cooperating instructors were each teaching three sections of Freshman English for the project, and since the writing and testing schedule called for 12 themes during the semester, the investigators agreed to provide necessary relief for these instructors through the use of Teacher Aides, in an adaptation of the Rutgers Plan for Lay Readers (Diederich, 1960).

Teacher Aides were recruited by public announcement in the local newspapers. Applicants were screened with a battery of tests, including the writing of an original essay, and those who qualified were interviewed by the investigators. From the qualified applicants, the investigators selected 12 people, 8 to act as Teacher Aides, and 4 to act as special readers for the pre, post, and retention STEP-Essay Tests.

All selected candidates were scheduled through an intensive 12 hour workshop training course in the editing and marking of freshman themes. After the training course, 8 Teacher Aides were assigned in pairs to each of the four cooperating instructors for further guidance and orientation, each pair under the direction of the instructor they would work with. Four candidates were given further special training by the investigators in the scoring of the STEP-Essay Tests, which they were assigned to read and rate according to the testing schedule.

Other personnel were recruited to act as Project Secretary, Research Assistants in Psychology, Special Consultants, and Clerical Assistants. These people were admitted to the project on the basis of their qualifications and interest.

Selection of final personnel came after conferences with the Campus Dean, Teaneck Campus, who provided suitable office and conference space together with appropriate equipment for the project headquarters and for the Teaching Machine Laboratory. With the Teaching Machine Laboratory established and equipped with 20 teaching machines, the investigators recruited a Laboratory Supervisor and three Laboratory Attendants, all drawn from the senior class, Teaneck Campus.

The Research Associate for the project assumed responsibility for the editorial revision of the program, based on data supplied by subjects who had worked with The Expository Use of the English Language in pilot studies during 1961-62. These revisions were undertaken to insure that the subjects in the project study would be using the most current and effective version of the program.

The Preliminary Planning Stage for Project 1750 had been completed by September 15, 1962, and on that date, the study moved into the Experimental Stage.

Experimental Stage

During the Experimental Stage, the data for the study was gathered and recorded, and procedures were instituted to keep the investigators informed on the state of project activities.

The answer tapes, on which the experimental subjects recorded their responses to the program, were collected as they were completed by the Laboratory Assistants, and filed by them at the end of the day under the direction of the Laboratory Supervisor. The Laboratory was staffed to operate 45 hours each week, including one evening session and one Saturday morning session, so the experimental subjects could work at their convenience. The Laboratory Supervisor met with the investigators every week to discuss the operating conditions in the Laboratory and to report on the progress in gathering and filing the answer tapes. These weekly conferences allowed for the solving of minor problems in the Laboratory as they arose. The investigators also made daily visits to the Teaching Machine Laboratory to assess the climate of operating conditions for themselves.

The project headquarters became a communications center for the processing of out-of-class work done by subjects in the control groups. The instructors assigned and collected the scheduled themes and the exercises in the workbook and handbook, and brought them to the project office. There the work was turned over to the Teacher Aides who took it home, read and marked it, and returned it to the office. Teacher Aides and instructors held conferences among themselves to review the grades and comments on the themes and exercises, with the investigators acting as informal observers. The work was then returned to the students for revision.

Conferences between Teacher Aides and subjects were held in the conference space provided in the project headquarters, where, once again, the investigators had the opportunity to act as informal observers. At the end of these conferences, the subjects left their themes, exercises and revisions, which were permanently filed in the project office.

During the Experimental Stage, the investigators also held general conferences with the instructors, and with the Teacher Aides. These formal meetings were called so that the investigators could hear opinions, gauge attitudes, and gather information on the reactions and performances of subjects as these appeared both to the Teacher Aides and to the instructors. Finally, after mid semester, the investigators held a series of interviews with about 20% of the experimental subjects to hear their reactions to the program they were working with, and to hear their opinions about various phases of the project.

Where special problems arose, the investigators met with appropriate consultants.

As a result of conferences, interviews, and observations, it became apparent to the investigators that it would be feasible and desirable to gather certain kinds of data other than that provided by the program itself and the primary measurement instruments, to act as collateral evidence in the interpretation of the results of the study. To this end, the investigators developed and administered the series of special measurement instruments.

With the administering of the January 1963 part of the testing schedule, the Experimental Stage was completed and the Data Processing and Concluding Stage began.

Data Analysis and Concluding Stage

Data gathered and recorded during the Experimental Stage were subjected to statistical treatment. Analyses of variance were calculated via standard statistical procedures. In cases of unequal cells, Snedecor's harmonic mean adjustment was used. All correlations which were performed are Pearson's Product-moment correlations except for the point biserial correlations computed between the 26 SPI items on the one hand and STEP gain scores and Program Test scores on the other. In all comparisons, the .05 level was adopted as the criterion of significance.

The final data gathered and processed were collected from all subjects in May, 1963, with the administration of the battery of follow-up retention tests.

Project 1750 was completed with the evaluation and interpretation of all relevant, processed data.

CHAPTER III

RESULTS AND CONCLUSIONS

It was the purpose of this study to determine the effectiveness of a program in the expository use of the English language, accompanying regular classroom instruction, compared to conventional out-of-class assignments given to freshman college and university students. This section presents the results of findings pertinent to the hypothesis and to the two basic questions posed by the study, as well as the outcomes of certain auxiliary analyses.

The Hypothesis

The following hypothesis was tested:

> Students will learn the expository use of the English language better through out-of-class programed instruction than through conventional out-of-class assignments.

The test of this hypothesis consisted of a comparison of the three treatment groups with respect to gain scores earned by the students on the STEP-Writing Tests and the STEP-Essays.

The first question which arose was whether the three groups were equivalent with respect to the STEP pretest measures. Tables 5-7 present relevant data. The analysis of variance (see tables 6-7) showed that the three treatment groups did not differ significantly in their performance on the two STEP Tests which were used as pretests. Thus, the treatment groups were initially equivalent.

Data pertinent to the hypothesis are embodied in Tables 8 and 10-12, which deal with the STEP-Writing Tests, and in

Tables 9 and 13-15, which deal with the STEP-Essays.

Slight, though statistically significant mean gains were earned by subjects in all treatment groups on the STEP-Writing Tests (Table 8) as well as on the STEP-Essays (Table 9). However, the analysis of variance of gain scores performed on both STEP Tests resulted in non-significant F ratios for treatment and for verbal aptitude, as measured by the SAT-V (Tables 11 and 14).

Since verbal aptitude was found to be a non-significant source of variation, additional analyses of variance were performed solely on the instructor by treatment groupings. The F ratios presented in Tables 12 and 15 indicate that no significant differences exist between the three treatment groups with respect to their gain scores on the STEP Tests.

In view of these results, the hypothesis cannot be supported; that is, students did not learn the expository use of the English language better through out-of-class programed instruction than through conventional out-of-class assignments, where "better" is defined as differences in mean gain scores.

The analysis of variance of the gain scores on the STEP-Writing Tests did yield significant F ratios for the interactions of instructor x treatment and instructor x SAT-V (Table 11). The basis of these interactions is unknown.

The analysis of variance of the gain scores on the STEP-Essays indicates that significant differences exist between instructors (Tables 14 and 15). Students of Instructor 4 earned the greatest gains, those of Instructor 2 incurred a net loss (Table 13). The differential gains or losses shown by students in certain groupings do not warrant any generalizable conclusions.

TABLE 5

Means and Standard Deviations of Scores on Pretests

Pretest	Treatment Group C1 (N=86) Mean	S.D.	C2 (N=93) Mean	S.D.	E (N=94) Mean	S.D.
STEP-Writing 1A	300.51	10.84	301.82	12.14	304.23	11.27
STEP-Essay 1A	6.80	2.13	7.20	2.48	7.27	2.12

TABLE 6

Analysis of Variance of Scores on STEP-Writing Test, Form 1A Used as Pretest

Source of Variation	Sum of Squares	d.f.	Meah Square	F	P
Between Groups	2,310.43	2	1155.22	2.496	>.05
Within Groups	124,939.78	270	462.74		
TOTAL	127,250.21	272			

TABLE 7

Analysis of Variance of Scores on STEP-Essay, Form 1A Used as Pretest

Source of Variation	Sum of Squares	d.f.	Mean Square	F	P
Between Groups	11.21	2	5.60	1.09	>.05
Within Groups	1387.12	270	5.14		
TOTAL	1398.33	272			

TABLE 8

Tests of Significance of Mean Gain Scores on STEP-Writing Tests

	Control 1	Control 2	Experimental
N	86	93	94
Mean	4.06	6.49	3.49
S.D.	11.11	10.19	12.05
t	3.41	6.12	2.79
P <	.005	.0005	.005

TABLE 9

Tests of Significance of Mean Gain Scores on STEP-Essays

	Control 1	Control 2	Experimental
N	86	93	94
Mean	0.76	0.64	1.12
S.D.	2.51	2.54	2.69
t	2.77	2.42	4.02
P <	.005	.01	.0005

TABLE 10

Means and Standard Deviations of Gain Scores on STEP-Writing Tests by Instructors and Treatment Groups

		N	Mean	S.D.
Instructor 1	C1	23	7.04	10.26
	C2	22	6.32	9.60
	E	22	3.73	10.57
Instructor 2	C1	23	7.17	9.74
	C2	24	4.83	11.42
	E	25	3.80	10.99
Instructor 3	C1	17	4.88	5.92
	C2	26	6.81	9.80
	E	24	1.00	15.01
Instructor 4	C1	23	-2.65	13.11
	C2	21	8.19	9.45
	E	23	5.52	10.48
Treatment Group	C1	86	4.06	11.11
	C2	93	6.49	10.19
	E	94	3.49	12.05
Instructor	1	67	5.72	10.25
	2	72	5.22	10.85
	3	67	4.24	11.54
	4	67	3.52	12.08
TOTAL		273	4.63	11.23

TABLE 11

Analysis of Variance of Gain Scores on STEP-Writing Tests
(SAT-V by Instructors by Treatment)

Source of Variation	Sum of Squares	d.f.	Mean Square	F	P
Instructor	297.72	3	99.24	0.81	>.05
Treatment	595.44	2	297.72	2.44	>.05
SAT-V	234.37	2	117.19	0.96	>.05
Interaction: Instructor x Treatment	3718.30	6	619.72	5.08	<.001
Interaction: Instructor x SAT-V	1989.01	6	331.50	2.72	<.05
Interaction: Treatment x SAT-V	557.43	4	139.36	1.14	>.05
Interaction: Instructor x SAT-V x Treatment	2071.35	12	172.61	1.42	>.05
Subjects (within)	28896.79	237	121.93		
TOTAL	34408.15	272			

TABLE 12

Analysis of Variance of Gain Scores on STEP-Writing Tests
(Instructors by Treatment)

Source of Variation	Sum of Squares	d.f.	Mean Square	F	P
Instructor	168.57	3	56.19	0.46	>.05
Treatment	457.07	2	228.54	1.86	>.05
Interaction: Instructor x Treatment	1627.32	6	271.22	2.21	<.05
Subjects (within)	32082.73	261	122.92		
TOTAL	34408.15	272			

TABLE 13

Means and Standard Deviations of Gain Scores on STEP-Essays by Instructors and Treatment Groups

		N	Mean	S.D.
Instructor 1	C1	23	0.83	2.51
	C2	22	1.59	2.46
	E	22	2.50	2.55
Instructor 2	C1	23	-1.04	1.65
	C2	24	-1.33	1.88
	E	25	-0.80	2.35
Instructor 3	C1	17	1.29	2.24
	C2	26	0.42	1.80
	E	24	0.92	1.78
Instructor 4	C1	23	2.09	2.38
	C2	21	2.19	2.52
	E	23	2.09	2.69
Treatment Group	C1	86	0.76	2.51
	C2	93	0.64	2.54
	E	94	1.12	2.69
Instructor	1	67	1.63	2.60
	2	72	-1.05	2.00
	3	67	0.82	1.94
	4	67	2.12	2.53
TOTAL		273	0.85	2.59

TABLE 14

Analysis of Variance of Gain Scores on STEP-Essays (SAT-V by Instructors by Treatment)

Source of Variation	Sum of Squares	d.f.	Mean Square	F	P
Instructor	240.71	3	80.24	14.76	<.001
Treatment	6.33	2	3.17	0.58	>.05
SAT-V	6.33	2	3.17	0.58	>.05
Interaction: Instructor x Treatment	0	6	0	0	--
Interaction: Instructor x SAT-V	12.67	6	2.11	0.39	>.05
Interaction: Treatment x SAT-V	12.67	4	3.17	0.58	>.05
Interaction: Instructor x Treatment x SAT-V	31.67	12	2.64	0.48	>.05
Subjects (within)	1288.51	237	5.44		
TOTAL	1836.23	272			

TABLE 15

Analysis of Variance of Gain Scores on STEP-Essays (Instructors by Treatment)

Source of Variation	Sum of Squares	d.f.	Mean Square	F	P
Instructor	385.76	3	128.59	24.27	<.001
Treatment	9.72	2	4.86	0.92	>.05
Interaction: Instructor x Treatment	22.69	6	3.78	0.71	>.05
Subjects (within)	1383.02	261	5.30		
TOTAL	1836.23	272			

Question No. 1

The question was posed:

> Do students with differing verbal aptitudes achieve better through out-of-class programed instruction than through conventional out-of-class assignments.

In order to answer this question correlations were computed between SAT-V scores and gain scores obtained by students in the three treatment groups on the two STEP tests. The results are shown in Table 16.

TABLE 16

Correlations Between SAT-Verbal Scores and STEP Gain Scores

Test	Treatment Group C1 (N=86)	 C2 (N=93)	 E (N=94)	Total (N=273)
Writing	0.15	0.02	0.04	0.07
Essay	0.13	-0.11	0.24*	0.16

*Significantly different from zero at the .02 level.

___Significantly different from each other at the .05 level.

For the STEP-Writing Tests the correlation coefficients do not differ significantly between the three groups. However, for the STEP-Essays, the correlation coefficient for Group E differs significantly from that of Group C2. All correlation coefficients obtained are quite small. With the exception of one comparison (STEP-Essay gains for Group E), none of the obtained correlation coefficients is significantly different from zero.

It appears that verbal aptitude, as measured by the SAT-V, is positively related to gains in writing ability as measured by the STEP-Essays, but not to gains in the ability to recognize correct English usage, as measured by the STEP-Writing Tests.

It may be concluded that those experimental subjects with higher verbal aptitude were helped by out-of-class programed instruction to write better essays but not to better recognize correct English usage in specimen samples written by others.

Question No. 2

Question No. 2, concerned with the retention of learning, asked the following:

> Do students who have worked with the program retain their knowledge of the expository use of the English language better than students who were given conventional out-of-class assignments?

This question was answered by comparing the treatment groups with respect to their retention scores made on the two STEP Tests. Relevant data are presented in Tables 17-20. The analysis of variance (Tables 19 and 20) resulted in non-significant *F* ratios for the treatment variable on both STEP Tests.

It may be concluded, therefore, that the students who had worked with the program did not retain their knowledge of the expository use of the English language better than did the students who were given conventional out-of-class assignments.

Analysis of variance of the retention scores on the STEP Writing Test indicate that no significant differences exist between instructors (see Table 19).

TABLE 17

Means and Standard Deviations of Retention Scores on STEP-Writing Tests

		N	Mean	S.D.
Instructor 1	C1	21	-0.76	11.00
	C2	19	-0.53	10.94
	E	20	-1.55	10.97
Instructor 2	C1	21	-3.24	9.68
	C2	21	-2.00	11.42
	E	23	-1.09	10.97
Instructor 3	C1	17	0.18	11.42
	C2	23	-3.30	12.60
	E	21	2.14	13.42
Instructor 4	C1	21	4.62	12.91
	C2	16	0.88	9.98
	E	20	3.20	11.58
Treatment Group	C1	80	0.20	11.68
	C2	79	-1.44	11.49
	E	84	0.63	11.94
Instructor	1	60	-0.95	10.98
	2	65	-2.08	10.76
	3	61	-0.46	12.79
	4	57	3.07	11.78
TOTAL		243	-0.18	11.74

TABLE 18

Means and Standard Deviations of Retention Scores on STEP-Essays

		N	Mean	S.D.
Instructor 1	C1	21	0.67	1.81
	C2	19	-0.26	2.22
	E	20	-1.40	2.24
Instructor 2	C1	21	1.10	1.44
	C2	21	0.67	1.58
	E	23	1.17	2.66
Instructor 3	C1	17	0.12	2.00
	C2	23	0.96	1.30
	E	21	0.43	1.97
Instructor 4	C1	21	-0.52	1.97
	C2	16	-0.13	1.32
	E	20	0.15	1.85
Treatment Group	C1	80	0.35	1.91
	C2	79	0.34	1.73
	E	84	0.13	2.41
Instructor	1	60	-0.31	2.26
	2	65	0.98	2.01
	3	61	0.54	1.79
	4	57	-0.18	1.79
TOTAL		243	0.28	2.05

TABLE 19

Analysis of Variance of Retention Scores on STEP-Writing Tests (Instructors by Treatment)

Source of Variation	Sum of Squares	d.f.	Mean Square	F	P
Instructor	876.33	3	292.11	2.10	> .05
Treatment	192.81	2	96.41	0.69	> .05
Instructor x Treatment	332.57	6	55.43	0.40	> .05
Subjects (within)	32118.95	231	139.04		
TOTAL	33520.67	242			

TABLE 20

Analysis of Variance of Retention Scores on STEP-Essays (Instructors by Treatment)

Source of Variation	Sum of Squares	d.f.	Mean Square	F	P
Instructor	69.61	3	23.20	6.03	< .001
Treatment	2.86	2	1.43	0.37	> .05
Instructor x Treatment	56.17	6	9.36	2.43	< .05
Subjects (within)	888.34	231	3.84		
TOTAL	1016.97	242			

2

The analysis of variance of the retention scores on the STEP Essays indicate that significant differences do exist between instructors (see Table 20). Students of Instructor 2 earned the greatest retention scores; scores for students of instructor 1 and instructor 4 show a net loss.(see Table 18).

Themes 4 and 6

Themes 4 and 6, impromptu themes, were written approximately in the middle of the fall semester under the same kind of controlled conditions established for the administration of the STEP Essay Tests. It was hoped that the analysis of these themes would help discern differences in writing ability, if any existed, between the three treatment groups.

The inter-rater reliability for Theme 4 was 0.27 ($N=210$; $p<.01$); for Theme 6 it was 0.21 ($N=211$; $p<.01$). Even though these reliabilities are statistically significant, they are quite low; therefore, these ratings are unreliable.

Tables 21-24 summarize the results of the analyses for Themes 4 and 6. The analysis of variance shows that on Theme 4, but not on Theme 6, significant differences exist between the three treatment groups (see Tables 23-24). On Theme 4, the mean rating of students in Group E was significantly greater than the mean ratings of students in either of the two control groups (see Table 21).

The analysis of variance (Themes 4 and 6) show also that significant differences exist between instructors (see Tables 23-24). Students of Instructor 4 earned the highest mean ratings on both themes; students of Instructor 2 obtained the lowest mean ratings on both themes (see Table 21-22).

In view of the inconsistency of the results, as well as the rather low rater reliabilities, it would be unwarranted to ascribe greater effectiveness to the out-of-class programed instructional treatment at the mid-semester period.

Correlations Between STEP Tests

Since the two STEP Tests served as criterion tests for better learning and better retention of the expository use of the English language, the correlations between the two tests are of considerable interest. The correlations between the three pairs of STEP-Tests[1] are statistically significant, though of moderate magnitude (Table 25). One may conclude that each STEP Test measures relatively independent dimensions of English usage.

Correlations Between STEP-Essays and Themes 4 and 6

Table 26 presents correlations between STEP-Essays and Themes 4 and 6.

Ratings on Theme 4 correlate significantly with ratings on STEP-Essays 1B and 1D. Ratings on Theme 6 correlate significantly with ratings on STEP-Essay 1B. The absence of a significant relationship between the ratings for Themes 4 and 6 and STEP-Essay 1A ratings; and the low theme inter-rater

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[1] Pretests (STEP-Writing 1A and STEP-Essay 1A); Posttests (STEP-Writing 1B and STEP-Essay 1B); Retention Tests (STEP-Writing 1A and STEP-Essay 1D).

TABLE 21

Means and Standard Deviations of Scores on Theme 4 by Instructors and Treatment Groups

		N	Mean	S.D.
Instructor 1	C1	15	7.47	1.82
	C2	20	8.05	1.83
	E	12	9.08	2.06
Instructor 2	C1	21	6.90	1.92
	C2	21	8.28	1.86
	E	24	9.08	2.36
Instructor 3	C1	10	8.60	2.15
	C2	17	8.53	1.91
	E	21	8.24	1.80
Instructor 4	C1	12	9.17	1.34
	C2	19	8.74	1.29
	E	18	10.22	1.84
Treatment Group	C1	58	7.81	2.06
	C2	77	8.39	1.77
	E	75	9.12	2.18
Instructor	1	47	8.13	1.98
	2	66	8.13	2.26
	3	48	8.42	1.92
	4	49	9.39	1.66
TOTAL		210	8.49	2.05

TABLE 22

Means and Standard Deviations of Scores on Theme 6 by Instructors and Treatment Groups

		N	Mean	S.D.
Instructor 1	C1	18	7.50	1.92
	C2	21	7.62	1.59
	E	12	7.25	1.48
Instructor 2	C1	20	7.05	1.63
	C2	20	7.30	1.76
	E	23	7.13	1.98
Instructor 3	C1	6	7.50	1.26
	C2	19	7.89	1.58
	E	22	7.73	2.07
Instructor 4	C1	11	8.91	1.50
	C2	21	9.67	1.78
	E	18	10.06	1.72
Treatment Group	C1	55	7.62	1.82
	C2	81	8.14	1.93
	E	75	8.03	2.22
Instructor	1	51	7.50	1.70
	2	63	7.16	1.81
	3	47	7.76	1.80
	4	50	9.64	1.75
TOTAL		211	7.96	2.01

TABLE 23

Analysis of Variance of Scores on Theme 4 (Instructors by Treatment)

Source of Variation	Sum of Squares	d.f.	Mean Square	F	P
Instructor	47.03	3	15.68	4.18	$< .01$
Treatment	42.32	2	21.16	5.64	$< .01$
Instructor x Treatment	28.22	6	4.70	1.25	$> .05$
Subjects(within)	742.44	198	3.75		
TOTAL	890.48	209			

TABLE 24

Analysis of Variance of Scores on Theme 6 (Instructors by Treatment)

Source of Variation	Sum of Squares	d.f.	Mean Square	F	P
Instructor	153.34	3	51.11	15.71	$< .01$
Treatment	0	2	0	0	0
Instructor x Treatment	2.19	6	0.37	0.11	0
Subjects(within)	647.64	199	3.25		
TOTAL	853.70	210			

TABLE 25

Correlations Between STEP Tests

Testing	Tests Correlated	N	r
Pretest	Writing 1A and Essay 1A	273	.27*
Posttest	Writing 1B and Essay 1B	179	.40**
Retention Test	Writing 1A and Essay 1D	159	.32**

*significantly different from zero at $p < .01$
**significantly different from zero at $p < .001$

TABLE 26

Correlations Between STEP-Essays and Themes 4 and 6

STEP-Essay Form	Theme 4 N	4 r	Theme 6 N	6 r
1A	210	.04	210	.01
1B	210	.36**	210	.32**
1D	190	.31**	190	.17

**significantly different from zero at $p < .01$

reliabilities, previously noted, suggest that the theme ratings represent relatively unreliable measures of students' writing ability.

Test on the Program

The Test on the Program, geared specifically to The Expository Use of the English Language, was designed to furnish data for answering the following questions:

1. Did the experimental subjects learn the specific content of the program?
2. What is the relationship between students' performance on the program and their performance on the STEP Tests?

Subjects in the Experimental Groups did significantly better on the Test on the Program than did subjects in either of the control groups (see Table 27), but the scores of the experimental subjects on this test are not significantly related to gain scores on either of the two STEP Tests (see Table 28).

The data suggest that although the experimental subjects effectively learned the content of the program, their knowledge did not effectively transfer to affect their performance on the STEP Writing or STEP Essay Tests.

Handbook Test

All subjects in all groups were permitted free, optional use of the standard handbook (Guth, Words and Ideas) specified for the study. The Student Questionnaire included a section on the handbook, one question asking directly whether or not the student had made optional use of the book to help him write his themes. The Handbook Test, based on sections of Words and Ideas listed in the common theme specifications as suggested readings, was designed as an indirect check on the answer to this question.

Since the maximum possible score on this test was 50, the means for all groups (see Table 27) are low. The data suggest that the subjects did not make conscientious independent use of the handbook. Findings based on the Handbook Test support the tenor of the direct answers made by the students in the Student Questionnaire.

Operating Characteristics of the Program

The answer tapes of a randomly selected sample of 30 students, representing about 30% of the subjects in Group E, were analyzed for error rate and mean time. Pertinent data are contained in Tables 29-32.

The laboratory was in operation for 14 weeks, during which the average experimental subject made 2666 responses to the 1514 frames comprising the program. A response which did not correspond exactly to the established correct response was counted as an error. The error rate/set ranged from 8% to 18% (Table 32). The error rate/student varied from 3% to 26% (Table 31) with a mean of about 12% and a standard deviation of about 6% (Table 29). Since the criterion of what constitutes an error in this study was more stringent than that applied in practical classroom use, the error rate determined in this study is appreciably higher than it would otherwise be.

The time to complete the whole program ranged from about 8-3/4 hours to about 18-3/4 hours (Table 31), with a mean of about 12-3/4 hours and a standard deviation of about 2-1/3 hours (Table 29).

Interviews with a random sample of 25% of the control group subjects revealed that the average student spent about 2 hours/week doing his workbook exercises and about 3 hours/week on his handbook exercises. In other words, the average control group student spend between 30-45 hours during the entire semester doing his conventional homework. In view of the average time spent with the program, about 12-3/4 hours, it is apparent that the programed instructional approach yielded similar results to conventional homework assignments but with a considerable smaller expenditure of time.

Student variability with respect to error rate and time needed to complete the program is quite impressive. Even though in this study students were required to complete a specified number of frames per week, it is apparent that this program, like other programed instructional materials, individualizes instruction.

Correlations between the program error rate and selected variables are shown in Table 30. The error rate is unrelated to completion time of the program, gain scores on the STEP-Essays, and retention scores on the two STEP Tests. Significant negative correlations were obtained between the error rate and gain scores on the STEP-Writing Tests and the Test on the Program.

TABLE 27

Means and Standard Deviations of Scores on the Program and the Handbook Tests

Test	Treatment Group C1 (N=86) Mean	 S.D.	 C2 (N=93) Mean	 S.D.	 E (N=94) Mean	 S.D.
Program	28.51	8.90	30.03	7.38	45.69[a]	7.98
Handbook	19.73	4.01	21.33	6.63	21.16[b]	4.97

[a] Mean of Group E is significantly different from means of Groups C1 and C2 at $p < .001$.

[b] None of the differences between group means are significant; i.e., $p > .05$.

TABLE 28

Correlations Between Scores on the Program Test and Gain Scores on the STEP Tests

Treatment Group	N	STEP Test Writing	 Essay
C1	86	.03	.12
C2	93	-.13	.01
E	94	.02	.02

TABLE 29

Characteristics of Program

Characteristic		Statistic
Number of Frames		1,514
Average Number of Responses		2,666
Errors - N		9,467
- Mean		315.57
- S.D.		159.45
Error Rate (%) - Mean		11.82
- S.D.		5.79
Time to Complete Program (Minutes)	- Mean	767.33
	- S.D.	142.26

TABLE 30

Correlations Between Program Error Rate and Selected Variables (N=30)

Variable	r
Gain Scores	
STEP-Writing Tests	-.40*
STEP-Essays	-.06
Retention Scores	
STEP-Writing Tests	.07
STEP-Essays	-.06
Test on the Program	-.67**
Time to Complete Program	-.02

*significantly different from zero at $p < .05$.
**significantly different from zero at $p < .01$.

TABLE 31

Performance of Individual Students on the Program (N=30)

Students	Number of Responses	Number of Errors	Error Rate (%)	Time to Complete Program (Minutes)
13102	2598	539	20.75	958
13103	2654	169	6.37	705
13105	2652	400	15.08	1120
13202	2776	181	6.53	848
13203	2697	300	11.12	714
13208	2641	190	7.19	702
13209	2771	417	15.06	1030
13213	2590	416	16.06	735
23104	2595	322	12.41	620
23106	2775	382	13.71	811
23110	2694	424	15.74	646
23205	2592	152	5.86	649
23208	2777	374	13.46	791
23211	2757	616	22.33	638
23216	2599	197	7.57	709
23217	2705	191	7.06	631
33108	2598	188	7.23	673
33109	2766	707	25.56	761
33110	2635	208	7.89	847
33113	2674	342	12.75	840
33201	2597	535	20.60	531
33202	2599	521	20.06	702
33206	2703	474	17.54	819
43101	2699	243	9.00	752
43105	2591	238	9.18	530
43108	2668	164	6.15	934
43109	2701	102	3.77	1051
43205	2576	240	9.31	713
43206	2593	151	5.82	865
43210	2545	084	3.30	691

TABLE 32

Performance of Students on Sets of the Program (N=30)

Set	No. Frames	No. Responses	N	Errors Mean	Errors S.D.	Error Rate	Time Mean	Time S.D.
1	24	864	65	2.17	1.92	7.52	15.57	4.42
2-3	25	1129	134	4.47	3.81	11.87	15.77	4.05
4	37	1787	156	5.20	3.52	8.73	19.43	4.99
5	19	856	72	2.40	2.29	8.41	10.03	5.39
6	26	910	100	3.33	1.83	10.99	13.27	3.65
7	65	3259	282	9.40	5.70	8.65	35.27	8.38
8	36	1410	124	4.13	3.47	8.79	16.70	3.94
9	52	2357	282	9.40	6.12	11.96	28.97	8.41
10	63	2997	394	13.13	7.21	13.15	34.00	9.02
11	72	3540	418	13.93	10.20	11.81	31.00	8.81
12	55	2609	419	13.97	6.86	16.06	29.30	6.89
12A	25	1170	193	6.43	4.22	16.50	11.70	3.20
13	72	4245	449	14.97	8.34	10.58	32.40	5.81
14	34	1679	210	7.00	5.02	12.51	17.70	4.55
15	55	3034	415	13.83	6.77	13.68	29.53	8.87
16	57	2157	383	12.77	6.34	17.76	29.90	6.88
V-1	40	2345	339	11.30	7.07	14.47	20.07	6.17
V-2	49	2572	373	12.43	9.13	14.50	24.73	6.47
V-3	44	2681	225	7.50	5.97	8.39	18.47	4.07
V-4	47	3089	295	9.83	6.17	9.55	26.20	6.93
V-5	84	6660	787	26.23	16.17	11.82	49.70	13.50
V-6	18	1203	195	6.50	3.33	16.21	13.27	3.80
V-7	24	1664	248	8.27	4.33	14.90	13.83	4.03
V-8	48	3206	466	15.53	10.37	14.54	27.83	8.53
V-9	50	1832	180	6.00	7.60	9.82	14.33	13.53
V-10	53	3257	401	13.37	8.53	12.31	27.70	7.03
V-11	28	1464	145	4.83	7.87	9.90	11.87	9.40
V-12	40	3672	514	17.13	12.57	14.00	29.93	6.07
S-1	32	1200	129	4.30	2.77	10.75	13.00	4.13
S-2	41	1437	154	5.13	2.89	10.72	17.07	4.13
S-3	50	2109	306	10.20	6.00	14.51	24.57	5.63
S-4	47	2184	166	5.53	4.20	7.60	19.90	5.37
S-5	46	2330	215	7.17	5.10	9.23	19.57	4.60
S-6	56	2910	233	7.77	6.93	8.00	24.63	6.50

The Study Preference Inventory[1]

The concern here was with the relationship, if any, between preferences for certain study habits and methods of teaching which are akin to programed instruction and the achievement of students when they are taught via programed instruction. "Achievement" was defined as "gain scores on the two STEP Tests" and "scores on the Program Test."

A factor analysis, performed on the 26 items comprising the Study Preference Inventory (SPI) showed that these items are relatively independent. Intercorrelations of the 26 SPI items are shown in Table 38, Appendix D.

Point-biserial correlations were computed between the 26 SPI items on the one hand and STEP gain scores and Program Test scores on the other (Tables 33 and 34). It can be seen that, with two exceptions, the SPI items correlate non-significantly with STEP gain scores (Table 33). Because of the large number of correlation coefficients obtained, it is quite likely that two would turn out to be significant by chance alone. The relationship between SPI items and scores on the Program Test, however, is quite different. Half of the 26 correlations are statistically significant (Table 34).

Previously it was noted (Table 28) the STEP gain scores are unrelated to Program Test scores. It is apparent that the two criteria for achievement are quite different from each other.

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[1] A specimen of the inventory is included in Appendix F.

Whereas gain scores on the STEP Tests reflect students' transfer of their knowledge of the program content, scores on the program test denote knowledge of the program content itself. Presumably, not STEP gain scores, but the Program Test scores represent the more relevant measure of content learning after exposure to programed instruction, and these are more relevant to SPI items.

Successful achievement with programed instruction, measured by the tailor-made program criterion test, seems, therefore, to be related to certain study preferences, such as the desire for immediate feedback, to progress in small steps, and to study one step at a time. For certain other key items, such as "liking to proceed at my own rate," non-significant correlations were found. Clearly, on the basis of the data gathered here, no definitive conclusions can be drawn regarding the relationship between students' preferences for study methods akin to programed instruction and their achievement when taught via this method. This aspect of the project was primarily exploratory in nature, the intent being to develop a suitable instrument, the Study Preference Inventory, and to gather preliminary data which will point the direction for future studies in this area. The results obtained so far are encouraging. Revisions and subsequent try-outs of the Study Preference Inventory promise to make it into a useful tool for studies of non-intellective aspects of successful achievement with programed instruction.

TABLE 33

Correlations Between Items of the Study Preference Inventory and Gain Scores on the STEP Tests (N=76)[a]

Item[b]	Writing	Essay
1	-.06	-.22
2	.16	-.09
3	.03	.18
4	.27*	.14
5	.25*	-.21
6	.14	-.16
7	-.12	-.12
8	.05	.21
9	.01	.02
10	.11	.04
11	-.17	-.14
12	.04	-.06
13	-.02	.08
14	-.03	.15
15	-.21	.15
16	.02	-.06
17	-.10	-.18
18	.14	.21
19	-.14	.01
20	-.01	-.06
21	-.02	-.15
22	-.01	.11
23	-.09	-.08
24	.05	.10
25	.09	-.07
26	.03	-.11

[a] Based on Subjects in Treatment Group E

[b] Items are listed in Appendix F

*$p < .05$

TABLE 34

Correlations Between Items of the Study Preference Inventory and Program Test Scores (N=76)[a]

Item[b]	Correlation Coefficient
1	.51**
2	.38**
3	.68**
4	.95**
5	.15
6	.17
7	.14
8	.98**
9	.31**
10	.12
11	.11
12	.25*
13	.17
14	.59**
15	.11
16	.20
17	.19
18	.39**
19	.17
20	.25*
21	.14
22	.10
23	.37**
24	.46**
25	.13
26	.27*

[a] Based on Subjects in Treatment Group E

[b] Items are listed in Appendix F

* $p < .05$

**$p < .01$

Student Questionnaire[1]

It was considered important to elicit students' reactions and comments regarding various phases of this project. These comments did illuminate different aspects of the study and suggested ways of improving subsequent studies in programed instruction.

The detailed data upon which the following conclusions are based are to be found in Table 37, Appendix C.

Theme Specifications

1. Less than half of the students (between 38%-45%) felt that the theme specifications were generally clear. Students of Instructors 3 and 4 regarded these specifications as clearer than did students of Instructors 1 and 2. Presumably, Instructor 3 and 4 clarified confusions if any existed (see 3 below).

2. Students were about equally divided in their judgment of the usefulness of the specifications.

3. The overwhelming majority of students in the three treatment groups (82%-91%) indicated that the themes were generally discussed in class.

4. Less than half of the students (N=116) offered specific comments. The majority of these remarks (N=72) expressed the feeling that the specifications were too vague, confusing, and constricting. Only four students considered them helpful.

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[1] A specimen of the questionnaire is included in Appendix E

Handbook: WORDS AND IDEAS

1. The majority of students in Group C2 (81%) used the handbook for regular assignments. While all of these students were required to use the handbook, apparently 19% of them did not do so.

2. The majority of C2 students (56%) felt that the handbook exercises were generally not useful; about 1/3 (35%) felt they were.

3. Slightly less than half of the students (between 43%-45%) used the handbook to help them write their themes. The handbook, available for reference to students in all groups, was not extensively used for optional study.

4. Students who employed the handbook as reference source used it, on the average, for the writing of between three to four themes. Since students were required to write 10 themes, the limited optional use of the handbook can again be observed.

5. Comments offered by 85 students reflected the tenor of the structured responses required by the questionnaire. There was mixed feeling regarding the utility of the handbook.

Workbook: INTRODUCTORY COLLEGE ENGLISH

1. All but one of the C1 students used the workbook; none of the students in the other two groups did. The workbook was used in accordance with the study design.

2. About 2/3 of the C1 students regarded the workbook exercises as generally useful.

3. Students' own written comments (N=38) corroborated the results listed above (2).

Professional Readers (Teacher Aides)

1. The majority of the students (68%-78%) knew the name of their reader. However, 74% of the students of Instructor 4 did not know their reader's name.

2. Between 44% and 55% of the students in the three treatment groups met once with their readers. Between 18% and 25% of them had two or more sessions. The students of Instructors 3 and 4 had fewer sessions with their readers than did students of Instructors 1 and 2.

3. Most students (45%-61%) liked meeting with their readers.

4. About half of the students (43%-57%) regarded these sessions as worthwhile.

5. Reactions regarding the practice of having readers mark students' themes were quite divided. About 1/3 of the students liked this practice, another 1/3 disliked it, and the remaining 1/3 felt indifferent.

6. Of the 94 students who added their own comments, 24 felt that the reader was not available often enough or long enough at a given time. Eight students perceived their readers as too severe and nine subjects referred to alleged inconsistencies in comments and/or grades among readers.

Program: THE EXPOSITORY USE OF THE ENGLISH LANGUAGE

This section of the questionnaire was answered only by students who used this program in the teaching machines.

1. In response to a list of descriptive terms, to which others could be added, students characterized the program as follows:

repetitious	(83%)	logical	(29%)
easy	(56%)	stimulating	(7%)
too elementary	(46%)	enjoyable	(6%)
boring	(55%)	useful	(35%)
Waste of time	(33%)	interesting	(21%)

Students' overall reaction to the program was inferred from the nature of the majority of terms checked. Thus, it was concluded that 69% of the students reacted unfavorably, 18% favorably, and 13% ambivalently.

2. Slightly less than half of the students (45%) thought that the program was not helpful in improving their writing skills. About 25% disagreed and another 28% weren't sure about the program's utility.

3. A slight majority (54% versus 40%) felt that using programed instruction (eg. teaching machines) had not interfered with the traditional teacher-pupil relationship.

4. In two sets, students were given the opportunity to skip several frames ahead if they demonstrated mastery of the preceding material. The bulk of the students (89%) appreciated this alternative.

Next, experimental students were requested to comment on the major advantage(s) and disadvantage(s) of the program and to offer suggestions regarding its improvement. Listed below are typical comments and the number of offering them listed in parentheses:

5. Major advantages of the program

Learning by repetition is easier (32)
Gives immediate feedback (13)
Allows no procrastination in doing homework (12)
Elementary mistakes are corrected (9)
Calls for independent study (8)

6. Major disadvantages of the program

The program is too time consuming (35)
The program is too elementary (21)
The program is too uninteresting (18)
The program is too repetitious (16)
The program eliminates the student-teacher relationship (11)

7. Suggestions for improvement of the program

Raise level of program content so that it is not so elementary (19)
Liven up the presentation with more interesting material (12)
Get fool-proof machines (13)
Discontinue use of the program in college (6)

8. Despite students' general negative reactions to the particular program they had been working on, most of them expressed a desire to learn other subjects via programed instruction. Programs they indicated they would like to use are in the areas of the Natural Sciences (19), Languages (14), Mathematics (11), Social Sciences (4), and Business (4).

Comments regarding Project No. 1750

We assume that several uncontrolled and uncontrollable factors may have adversely affected the outcome of this study. In order to get the students' perspective, they were asked to check those factors which they regarded as possible sources of difficulty. Room was also provided for the listing of additional factors. Following are their responses:

Cheating while using the teaching machines (52% of Experimental students)
Lack of sufficient contact with readers (42%-52%)
Basis for grading themes was not made clear (47%-60%)
Themes were not usually discussed in class (17%-18%)

Less than 5% of the students listed additional factors such as "theme topics not interesting," "lack of communication between reader and student," and "not enough discussion of work in classroom."

Lastly, students were asked to offer suggestions and recommendations which they felt might improve future studies in programed instruction. Following are the suggestions voiced most frequently, with the number of students giving them listed in parentheses:

Program sets should be less elementary and less repetitious (13)
Instructors should have a clear function in the project (8)
Students should have more sessions with their readers (7)
Theme topics should be of more interest to students (3)
Theme instructions should be clear (6)
Student participation in a project should be voluntary (5)
Program sets should be shorter and more to the point (2)
Readers and instructors should work together more closely (2)

Inasmuch as only a small portion of students bothered to write comments, one cannot assume that these necessarily reflect the thinking of all students. However, each of the 23 specific suggestions which were offered merit consideration.

CHAPTER IV

DISCUSSION, IMPLICATIONS, AND SUGGESTIONS

Discussion

It is always difficult to account for non-significant data, and especially difficult to find and trace the line bounding reason on one side and rationalization on the other, so that interpretation can be held within the bounds of reason.

The posited hypothesis for Project 1750 was that students in the experimental groups would learn the expository use of the English language better (that is, show higher gain and retention scores) than would the students in the control groups. Data yielded by the study does not support the hypothesis. But this same data, together with collateral evidence, suggest lines of exploration that might lead to an account of why the results are non-significant. In attempting to explain why the experimental subjects did not achieve as they were expected to, it seems reasonable to inquire into the conditions under which they did, in fact, work and also into what they were expected to do.

Subjects in the experimental groups were required to work through a minimum number of sets each week during the experimental stage of the project, and they were required to come to the Teaching Machine Laboratory to do their work. Students in the control groups, on the other hand, did their out-of-class work at home, or perhaps in the library. While the experimental subjects spent less time (fewer working hours) on their out-of-class work than students in the control groups did, interviews with subjects in the experimental groups gave the impression that these students nevertheless felt put upon. They seemed to consider work with the program less as out-of-class work, and more as an extra class session that they had been required, not asked, to take. Under these circumstances, it is not surprising that the exigencies of the experimental design created resentment and aroused resistance in the subjects. Several students in the experimental groups admitted informally that they would have enjoyed using the program more if they could have taken a copy home to work with when they felt like doing this. What they suggested was, perhaps, the most congenial way to use a program as out-of-class work, but it would have made the gathering of controlled data on this critical aspect of the study impossible.

Two other factors in the experimental situation seemed to feed the feeling of resentment and to strengthen the resistance of the experimental subjects. For one thing, they read the program through the medium of a teaching machine. The investigators had decided to use machines rather than a book format for the program in order to increase the likelihood of getting the students' first and unaltered responses to the items in the frames. But the machines, under continual use for 14 weeks, developed minor, intermittent mechanical malfunctions. Delays caused by machine breakdown elicited bitter and derisive comments from the experimental subjects, as reported by the Teaching Machine Laboratory Supervisor.

Then too, no tests were given on the content of the program during the experimental stage, and the subjects were given no marks or ratings for the work they did in the laboratory; the investigators wanted to get responses as "free" as possible from the subjects. But the students, having gone through an educational process in grade school and secondary school centered on examinations and grades, felt uneasy at this procedure, and finally, when they knew their work on the program in the laboratory would not be graded, and would not affect their final course grade, developed an indifference toward work with the program and tended to see their activity in the Teaching Machine Laboratory as a rather unpleasant, annoying, and pointless chore. This reaction to ungraded "homework" is similar to that reported by Albright for High School students, working with ungraded, self-correcting exercises (Albright, 1961).

In the opinion of the investigators, this attitude, observed in the experimental subjects, probably accounts for the marked incidence, noted in the Student Questionnaire, of "cheating" as a way to end the task-doing as soon as possible (the machines turned out to be no more cheat-proof than they were mechanically perfect). It is likely, too, that this same attitude goes a long way toward accounting for the rather high error rate recorded for the experimental use of the program; the subjects simply did not take the work seriously. The difference between actual errors in responses, and the self-scoring of errors by the subjects seems to support this likelihood; the subjects tended to be generous in their own behalf in judging which of their responses were correct and which were errors. A more stringent scoring showed many more erroneous responses than the students tended to admit to, but the point is that many of these errors, upon inspection, strongly suggested sheer carelessness in the writing of responses. The subjects were apparently satisfied with approximations.

Taken together, the feeling of resentment on the part of the experimental subjects, based on their conviction of having been assigned an "extra class" without having been consulted about it; their cavalier attitude toward working with the program after they knew that they would not be held "responsible" for their work (in the sense that they would not have to pass an examination, get a mark, or have their course grade put in jeopardy); and the minor but annoying frustrations they suffered because of frequent mechanical failures of the teaching machines--all this tended to mitigate against their making the best use that they might have of the program itself.

These factors, too, might help reconcile the general negative reaction of the experimental subjects against the particular program used in the project study, while at the same time they apparently did not develop a generally hostile attitude toward the enterprise of programed instruction. At least some of their expressed reaction against The Expository Use of the English Language could probably be attributed to general resentment. In the Student Questionnaire, a rather large number of these subjects voluntarily suggested other disciplines (mostly Mathematics, Physical Science and Foreign Languages) in which they would be willing to work with programed presentations, though not under the same conditions as those they had just experienced in this project study.

Despite their evident resistance in this project, however, experimental subjects did learn the content of the program, as the results of the Test on the Program show; that is, on a test composed of criterion frames, the subjects generally gave correct responses, and many more of them, than the students in the control groups, who had not seen the program, did. But the definition of "learn the expository use of the English language better" was, for this study, taken to mean "produce higher gain scores on standardized criterion tests." The experimental subjects did not, in this sense, "learn better." Perhaps a clear look at what they were expected to do, especially in the light of the conditions under which they used the program, might help explain this disappointing result.

The content of The Expository Use of the English Language, the workbook assignments, and the handbook assignments were kept parallel, to the extent that this was possible, in the kind and scope of the material they offered for study. The out-of-class work of the control groups, however, was marked and corrected by Teacher Aides, returned to the subjects with comments, and sometimes even discussed in conference. But their work with the program, as explained before, was not discussed in any way with the experimental subjects. So, while all subjects were assigned comparable out-of-class material, only the subjects in the control groups had their work processed in a familiar way.

The experimental design was such that all subjects in all groups were required to transfer what they learned in their out-of-class work to the themes they were assigned to write each week. Students in the experimental groups, working under conditions marked by their own general protest, were required to make this transfer all but unaided. The only help they had came from hints in the theme specifications (see Appendix J), while subjects in the control groups had, in addition, whatever help the familiar procedures for handling homework gave them, along with advice and comments on this work from their readers.

The investigators believe that under the conditions in which the program was used, both in the environment of the Teaching Machine Laboratory and in what was expected from the experimental subjects, the out-of-class use of programed instruction was put to a radically severe test.

It is worth pointing out, then, that while the experimental subjects did not achieve "better" within the limits of meaning set for this term by Project 1750, they did achieve as well as the subjects in the control groups, and with a considerable saving in the time they invested in out-of-class study.

Students in the control groups who did out-of-class assignments in the workbook spent an estimated 2 hours each week on them, as interviews with these students revealed. Students who did regular out-of-class assignments in the handbook, as the investigators learned in interviews with them, spent about 3 hours each week on this work. Subjects in the control groups, then, spent about 30 to 45 hours during the semester on out-of-class work, while students in the experimental groups spent an average of 12-3/4 hours in the laboratory during the same semester, covering a comparable amount of material. On the average, subjects in all groups showed similar results on the criterion tests (STEP-Writing Test and STEP-Essay Test).

Implications

In view of the results of Project 1750, the investigators believe that several conclusions may reasonably be drawn.

1. The isolated use of a program as out-of-class work, where the student is not informed of his status or progress by the usual indication of a grade; and where the student is expected to assume unaided the entire burden of transferring the content of the program to another situation, such as the writing of original essays, represents a bare, minimal use of programed instruction.

Under these conditions, the student is likely to feel uneasy and uncomfortable to the point of anxiety, expressed as resentment; is not likely to take his work with the program seriously and so become easily bored and tempted to "cheat"; and is likely to feel that the content of the program has little relationship to any context beyond the program itself.

The answers of the experimental subjects to the questions about the program in the Student Questionnaire support these observations.

2. A program apparently does teach the content it presents, even when it is used in what is assumed to be a minimum way.

Means for experimental subjects on the Test on the Program were significantly higher than means for control subjects. Since this test was composed of criterion frames from the program (see Appendix G), it is apparent that the experimental subjects, on the average, learned what was presented in The Expository Use of the English Language. Their success in applying what they learned is another matter.

3. Data yielded by this study suggest that students make the transfer of program content at least as well as students transfer the content of more traditional kinds of out-of-class work to the writing of original essays. It is not clear, however, exactly what these data indicate.

Means of gain scores on the STEP Tests for all treatment groups were small; therefore, the evidence for transfer must be viewed with caution. Means of gain scores for all treatment groups were about the same; therefore, even though there is some reason for believing that the experimental subjects achieved their gains with less help from conventional sources than control subjects did, and even though the evidence strongly indicates that experimental subjects spent fewer hours in out-of-class work than control subjects did, the interpretation must be cautious. Clear advantages for out-of-class use of programed instruction cannot be claimed, except for a savings in time, because it may possibly be the case that out-of-class treatment of any sort produces about the same effect upon the kind of linguistic behavior measured in this project. Future experimental study may decide the point.

4. A program that attempts to teach something about his own language to a native speaker may not be equally effective for all native speakers.

In the case of a study in English, when that is the native language of the subjects, some special factors must be considered. Students enter colleges and universities with a set of well established linguistic habits, acquired in obscure ways, and not all of these habits promote a use of "standard English." It may well be the case that non-standard uses of the language, made habitual by long practice, must be identified and altered by a process slower than one semester of the college freshman year can make possible, and by procedures more complex than the present techniques of program construction can comprehend.

Other data gathered in this study seem to support this observation.

The verbal subscore of the Scholastic Aptitude Test was taken as the measure of verbal aptitude for subjects in this study. Correlations between the SAT-V scoresand gain scores on the STEP Tests suggest that there is a positive relation between SAT-V scores and gains in writing. Although there were no significant differences in correlation coefficients between SAT-V and STEP-Writing scores among the treatment groups, the correlation coefficient for subjects in the experimental groups differed significantly from zero, and from that of subjects in Control 2 groups on the STEP-Essay (Chapter III, p.46.).

The findings seem to indicate that out-of-class use of the program helped experimental subjects with higher verbal aptitudes to write better essays, though not to improve their ability to recognize "correct" (standard) English in specimens of writing produced by others.

Perhaps these results are best regarded as inconclusive, but it does not seem unreasonable to assume that a student with a higher SAT-V score has fewer non-standard habits of usage to overcome than a student with a lower SAT-V score has. It is further not unreasonable to assume that the student with a higher SAT-V score is in a better position to take responsibility for his own linguistic improvement than the student with a lower score is. Therefore, the student with better linguistic aptitude may profit more from the use of a program than the student who is less better equipped linguistically. That is to say, to the extent that a program represents independent study, the better prepared student stands to profit from it more than the student whose preparation is poorer.

These assumptions, however, need to be tested by specific research.

Suggestions for Further Research

Results and findings of Project 1750 indicate several areas in which further research seems to be needed before the effective use of programed instruction, at least for a college freshman English course, can be fully ascertained. The following suggestions seem to be pertinent:

(1) It would be useful to discover the conditions under which transfer of program content occurs, and to identify the operational

factors through which transfer happens. Research in this area is needed so that the effectiveness of a program as a teaching instrument can be measured. It is reasonably well established in the literature that programs teach their content, but it is important to know what can be done with the content beyond the limits of the program itself.

(2) It is necessary to develop programs in all aspects of the English language for use at college and university levels, since few such programs exist at present.

The successful development of such programs, however, must take into account the special difficulties involved in teaching native speakers something about their own language. The content must be reasonably sophisticated and appropriate techniques must be found for conveying it. Research is needed to find programing techniques for presenting complex material in accurate, and interesting ways.

(3) It would be useful to discover some of the more nearly maximum uses to which a program may be put. Research in this area should probably include the experimental use of programed instruction as an integrated part of a course rather than as isolated out-of-class work.

Any use of a program should probably include a system of examinations on the content and grades for the students working with it.

Any use of a program in a college English course should probably extend for at least a full academic year, since one semester is too short a time to produce much change in the linguistic habits of the students.

(4) It seems reasonable to assume that programed instruction, like other methods of instruction, is more effective when used by certain kinds of students than by others. Therefore, it would be useful to determine which personality characteristics of students are associated with the effective use of a program. Research is needed to determine the relation between achievement with programed instruction and such personality traits as the differential need for immediate reinforcement, the need for autonomy, the need to think along logical lines, and the tolerance for ambiguity. Answers supplied by such research would be useful in developing techniques for programing, suggested in (2) above.

CHAPTER V

SUMMARY

The study sought to determine the effectiveness of a program in the expository use of the English language, accompanying regular classroom instruction, compared to conventional out-of-class assignments given to freshman college and university students.

It was hypothesized that students will learn the expository use of the English language better through out-of-class programed instruction than through conventional out-of-class assignments.

In addition, the following questions were posed:

(1) Do students with differing verbal aptitudes achieve better through out-of-class programed instruction than through conventional out-of-class assignments?

(2) Do students who have worked with the program retain their knowledge of the expository use of the English language better than students who were given conventional out-of-class assignments?

The population consisted of the 1962 entering freshman class at Fairleigh Dickinson University, Teaneck, New Jersey, about 500 students, which represented a cross section of the socio-economic groups in the New York Metropolitan Area. The sample, 273 students, was randomly distributed into 12 freshman English sections. Four freshman English instructors were assigned three sample sections each: an experimental and two control sections. All students attended regular classes. The out-of-class treatment given each section was as follows:

SECTION	TREATMENT
Experimental	Students worked, during the first semester on the Rowland-Tohtz program, *The Expository Use of the English Language* and used as reference the standard course handbook (Guth: *Words and Ideas*).
Control 1	Students used the workbook (Guth: *Introductory College English*) and used the standard handbook as reference.
Control 2	Students did assigned exercises in the standard course handbook and also used it as reference.

The exercises in the workbook and handbook were coordinated with the programed presentation.

All students were tested with alternate forms of STEP-Writing and STEP-Essay tests at three periods: (1) at the beginning of the fall semester 1962 (pretesting), (2) toward the end of the fall semester 1962 (posttesting), and (3) toward the end of the spring semester 1963 (retention testing).

The verbal subscore of the College Board Scholastic Aptitude Test was used as the measure of verbal aptitude.

Specially trained Teacher Aides corrected workbook and handbook exercises, and themes. Four specially trained readers scored the STEP-Essays.

In addition to the standardized STEP Tests, specially constructed tests and questionnaires were administered to all subjects.

The following major conclusions were drawn:

(1) Students did not learn the expository use of the English language better through out-of-class programed instruction, furnished by the Rowland-Tohtz program, than through conventional out-of-class assignments, where "better" was defined as "higher gain scores on STEP-Writing and STEP-Essay Tests."

(2) Students with higher verbal aptitude were helped by out-of-class programed instruction to write better essays but not to better recognize correct English usage in specimen samples written by others.

(3) Students who had worked with the program did not retain their knowledge of the expository use of the English language better than did students who were given conventional out-of-class assignments, where "better" was defined as "higher retention scores on STEP-Writing and STEP-Essay Tests."

(4) Use of the program as an out-of-class assignment resulted in a considerable saving of time usually spent by students doing their homework.

Limitations and implications of this study were discussed. Several avenues for further research were also explored.

General findings in this study agree with findings in similar studies in which programed instruction is compared with more conventional teaching methods. The experimental subjects achieved at least as well as control subjects did, where achievement was measured in gain and retention scores on standardized tests. Experimental subjects spent far fewer hours on out-of-class work with the program than control subjects did on out-of-class exercises in the workbook and handbook.

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APPENDIX A

TABLE 35

Means and Standard Deviations of Gain Scores on STEP-Writing Tests by SAT-V Groups

SAT-V Group[a]		Instructor 1 (N=67)			Instructor 2 (N=72)		
		C1	C2	E	C1	C2	E
	N	9	11	7	9	8	7
Low	$\bar{X}$	7.56	7.45	2.86	7.67	3.50	8.14
	SD	5.96	8.22	10.26	10.51	9.33	6.85
	N	8	4	8	8	6	12
Middle	$\bar{X}$	3.12	0	2.50	5.50	5.50	4.75
	SD	7.06	15.39	6.61	7.19	11.09	11.76
	N	6	7	7	6	10	6
High	$\bar{X}$	11.50	8.14	6.00	8.67	5.50	-3.17
	SD	15.58	4.45	13.72	11.08	12.94	9.92
	N	23	22	22	23	24	25
Total	$\bar{X}$	7.04	6.32	3.73	7.17	4.83	3.80
	SD	10.26	9.60	10.57	9.74	11.42	10.99

[a] Low = Bottom 1/3 of scores
Middle = Middle 1/3 of scores
High = Upper 1/3 of scores

(Table continued on next page)

TABLE 35(continued)

SAT-V Group[a]		Instructor 3 (N=67)			Instructor 4 (N=67)			
		C1	C2	E	C1	C2	E	Total
	N	4	11	8	12	5	--	91
Low	$\bar{X}$	3.75	10.91	2.38	-1.50	1.20	--	5.12
	SD	2.59	7.06	10.83	12.65	11.07	--	10.11
	N	11	6	10	10	7	1	91
Middle	$\bar{X}$	7.18	3.00	-3.40	-1.60	11.28	21.00	3.58
	SD	5.13	7.96	14.76	11.88	8.63	0	11.07
	N	2	9	6	1	9	22	91
High	$\bar{X}$	-5.50	4.33	6.50	-27.00	9.67	4.82	5.37
	SD	0.50	11.74	17.80	0	6.75	10.17	12.47
	N	17	26	24	23	21	23	273
Total	$\bar{X}$	4.88	6.81	1.00	-2.65	8.19	5.52	4.63
	SD	5.92	9.80	15.01	13.11	9.45	10.48	11.23

APPENDIX B

TABLE 36

Means and Standard Deviations of Gain Scores on STEP-Essays by SAT-V Groups

SAT-V Group[a]		Instructor 1 (N=67)			Instructor 2 (N=72)		
		C1	C2	E	C1	C2	E
	N	9	11	7	9	8	7
Low	$\bar{X}$	-.11	1.73	2.86	-1.00	0.12	-1.43
	SD	1.29	2.49	1.64	1.63	1.27	0.90
	N	8	4	8	8	6	12
Middle	$\bar{X}$	1.25	0	1.88	-1.50	-1.83	-0.50
	SD	3.49	2.24	2.80	1.50	1.34	2.93
	N	6	7	7	6	10	6
High	$\bar{X}$	1.67	2.28	2.86	-0.50	-2.20	-0.67
	SD	1.80	2.12	2.85	1.71	1.89	2.05
	N	23	22	22	23	24	25
Total	$\bar{X}$	0.83	1.59	2.50	-1.04	-1.33	-0.80
	SD	2.51	2.46	2.55	1.65	1.88	2.35

[a] Low = Bottom 1/3 of scores
Middle = Middle 1/3 of scores
High = Upper 1/3 of scores

(Table continued on next page)

TABLE 36 (continued)

SAT-V Group[a]		Instructor 3 (N=67)			Instructor 4 (N=67)			
		C1	C2	E	C1	C2	E	Total
	N	4	11	8	12	5	--	91
Low	$\bar{X}$	0.75	0.64	0.88	2.83	1.20	--	0.85
	SD	0.83	2.10	1.45	2.30	1.47	--	2.24
	N	11	6	10	10	7	1	91
Middle	$\bar{X}$	1.64	0.17	0.90	1.20	2.00	2.00	0.57
	SD	2.67	1.77	1.81	2.27	2.39	0	2.73
	N	2	9	6	1	9	22	91
High	$\bar{X}$	0.50	0.33	1.00	2.00	2.89	2.09	1.11
	SD	0.50	1.33	2.08	0	2.84	2.74	2.79
	N	17	26	24	23	21	23	273
Total	$\bar{X}$	1.29	0.42	0.92	2.09	2.19	2.09	0.85
	SD	2.24	1.80	1.78	2.38	2.52	2.69	2.59

TABLE 37

Responses to Student Questionnaire by Treatment Groups and Instructors

Section A(1): Were the theme specifications generally clear?

Response	Treatment Group						Instructor							
	C1		C2		E		1		2		3		4	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Yes	33	37.5	37	39.4	42	44.7	15	22.4	15	20.8	40	58.8	42	60.9
No	51	58.0	57	60.6	44	46.8	51	76.1	54	75.0	23	33.8	24	34.8
Don't Know	2	2.3	0	0	0	0	0	0	2	2.8	0	0	0	0
No Response	2	2.3	0	0	8	8.5	1	1.5	1	1.4	5	7.4	3	4.3

Section A(2): Were the theme specifications generally useful?

Response	Treatment Group						Instructor							
	C1		C2		E		1		2		3		4	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Yes	40	45.5	38	40.4	51	54.3	29	43.3	21	29.2	48	70.6	31	44.9
No	40	45.5	52	55.3	37	39.4	33	49.3	47	65.3	15	22.1	34	49.3
Don't Know	4	4.5	2	2.1	1	1.1	2	3.0	3	4.2	1	1.5	1	1.4
No Response	4	4.5	2	2.1	5	5.3	3	4.5	1	1.4	4	5.9	3	4.3

Section A(3): Were the themes generally discussed in class?

Response	Treatment Group						Instructor							
	C1		C2		E		1		2		3		4	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Yes	80	90.9	80	85.1	77	81.9	63	94.0	64	88.9	56	82.4	54	78.3
No	6	6.8	13	13.8	12	12.8	2	3.0	8	11.1	8	11.8	13	18.8
No Response	2	2.3	1	1.1	5	5.3	2	3.0	0	0	4	5.9	2	2.9

(Table continued on next page)

TABLE 37 (continued)

Section B(1): Did you use this handbook for regular assignments?

Response	Treatment Group						Instructor							
	C1		C2		E		1		2		3		4	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Yes	24	27.3	76	80.9	8	8.5	28	41.8	27	37.5	30	44.1	23	33.3
No	62	70.5	18	19.1	81	86.2	38	56.7	45	62.5	36	52.9	42	60.9
No Response	2	2.3	0	0	5	5.3	1	1.5	0	0	2	2.9	4	5.8

Section B(2): Were the handbook exercises generally useful?

Response	Treatment Group						Instructor							
	C1		C2		E		1		2		3		4	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Yes	14	15.9	33	35.1	11	11.7	14	20.9	14	19.4	18	26.5	12	17.4
No	39	44.3	53	56.4	25	26.6	26	38.8	32	44.4	27	39.7	32	46.4
Don't Know	29	33.0	8	8.5	43	45.7	22	32.8	25	34.7	14	20.6	19	27.5
No Response	6	6.8	0	0	15	16	5	7.5	1	1.4	9	13.2	6	8.7

Section B(3): Did you use this handbook to help you write your themes?

Response	Treatment Group						Instructor							
	C1		C2		E		1		2		3		4	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Yes	38	43.2	42	44.7	40	42.6	36	53.7	22	30.6	34	50.0	28	40.6
No	46	52.3	52	55.3	46	48.9	29	43.3	49	68.1	30	44.1	36	52.2
No Response	4	4.5	0	0	8	8.5	2	3.0	1	1.4	4	5.9	5	7.2

(Table continued on next page)

APPENDIX C

TABLE 37 (continued)

Section B(4): If you answered "yes" in question No. 3, for how many themes did you use this handbook?

Response (No. of Themes)	Treatment Group						Instructor							
	C1		C2		E		1		2		3		4	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	4	4.5	0	0	5	5.3	1	1.5	3	4.2	3	4.4	2	2.9
2	8	9.1	6	6.4	8	8.5	6	9.0	4	5.6	8	11.8	4	5.8
3	11	12.5	7	7.4	5	5.3	5	7.5	7	9.7	8	11.8	3	4.3
4	5	5.7	7	7.4	9	9.6	10	14.9	4	5.6	4	5.9	3	4.3
5	5	5.7	3	3.2	2	2.1	3	4.5	0	0	3	4.4	4	5.8
6	2	2.3	4	4.3	2	2.1	5	7.5	0	0	2	2.9	1	1.4
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	2	2.3	12	12.8	8	8.5	4	6.0	1	1.4	7	10.3	10	14.5
No Response	51	58.0	55	58.5	55	58.5	33	49.3	53	73.6	33	48.5	42	60.9

Section C(1): Did you use this workbook?

Response	Treatment Group						Instructor							
	C1		C2		E		1		2		3		4	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Yes	85	96.6	0	0	0	0	22	32.8	22	30.6	17	25.0	24	34.8
No	1	1.1	82	87.2	82	87.2	40	59.7	46	63.9	38	55.9	41	59.4
No Response	2	2.3	12	12.8	12	12.8	5	7.5	4	5.6	13	19.1	4	5.8

(Table continued on next page)

TABLE 37 (continued)

Section C(2): Were the workbook exercises generally useful?

Response	Treatment Group						Instructor							
	C1		C2		E		1		2		3		4	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Yes	58	65.9	1	1.1	0	0	14	20.9	13	18.1	15	22.1	17	24.6
No	19	21.6	2	2.1	3	3.2	6	9.0	7	9.7	4	5.9	7	10.1
Don't Know	9	10.2	3	3.2	46	48.9	12	17.9	21	29.2	12	17.6	13	18.8
No Response	2	2.3	88	93.6	45	47.9	35	52.2	31	43.1	37	54.4	32	46.4

Section D(1): The name of your reader: Mrs. _______
(or check "don't know")

Response	Treatment Group						Instructor							
	C1		C2		E		1		2		3		4	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Know	69	78.4	67	71.3	64	68.1	62	92.5	60	83.3	62	91.2	16	23.2
Don't Know	17	19.3	27	28.7	27	28.7	4	6.0	12	16.7	4	5.9	51	73.9
No Response	2	2.3	0	0	3	3.2	1	1.5	0	0	2	2.9	2	2.9

Section D(2): How many sessions did you have with your reader?

Response (No. of sessions with reader)	Treatment Group						Instructor							
	C1		C2		E		1		2		3		4	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
0	15	17.0	27	28.7	35	37.2	3	4.5	9	12.5	36	52.9	29	42.0
1	48	54.5	41	43.6	42	44.7	22	32.8	55	76.4	17	25.0	37	53.6
2	22	25.0	20	21.3	17	18.1	40	59.7	8	11.1	8	11.8	3	4.3
3	1	1.1	4	4.3	0	0	2	3.0	0	0	3	4.4	0	0
4	1	1.1	2	2.1	0	0	0	0	0	0	3	4.4	0	0
5	1	1.1	0	0	0	0	0	0	0	0	1	1.5	0	0

(Table continued on next page)

TABLE 37 (continued)

Section D(3): How do you feel about meeting with your reader?

Response	Treatment Group						Instructor							
	C1		C2		E		1		2		3		4	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Like it	54	61.4	44	46.8	42	44.7	38	56.7	43	59.7	25	36.8	34	49.3
Dislike it	4	4.5	7	7.4	3	3.2	6	9.0	4	5.6	1	1.5	3	4.3
Indifferent	17	19.3	21	22.3	21	22.3	21	31.3	17	23.6	13	19.1	8	11.6
No Response	13	14.8	22	23.4	28	29.8	2	3.0	8	11.1	29	42.6	24	34.8

Section D(4): Are these sessions generally worthwhile?

Response	Treatment Group						Instructor							
	C1		C2		E		1		2		3		4	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Yes	50	56.8	40	42.6	43	45.7	37	55.2	42	58.3	27	39.7	27	39.1
No	14	15.9	21	22.3	12	12.8	20	29.9	15	20.8	3	4.4	9	13.0
Don't Know	17	19.3	24	25.5	19	20.2	8	11.9	10	13.9	20	29.4	22	31.9
No Response	7	8.0	9	9.6	20	21.3	2	3.0	5	6.9	18	26.5	11	15.9

Section D(5): How do you feel about having readers mark your themes?

Response	Treatment Group						Instructor							
	C1		C2		E		1		2		3		4	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Like it	28	31.8	26	27.7	32	34.0	21	31.3	22	30.6	28	41.2	15	21.7
Dislike it	31	35.2	42	44.7	29	30.9	27	40.3	35	48.6	15	22.1	25	36.2
Indifferent	27	30.7	23	24.5	27	28.7	17	25.4	14	19.4	22	32.4	24	34.8
No Response	2	2.3	3	3.2	6	6.4	2	3.0	1	1.4	3	4.4	5	7.2

(Table continued on next page)

TABLE 37 (continued)

Section E(1): Check those terms which you feel generally describe this program.

Term	Rating[a]	Treatment Group E N	Treatment Group E %	Instructor 1 N	Instructor 1 %	Instructor 2 N	Instructor 2 %	Instructor 3 N	Instructor 3 %	Instructor 4 N	Instructor 4 %
Interesting	f	20	21.3	5	22.7	2	8.0	8	33.3	5	21.7
Repetitious	u	78	83.0	15	68.2	24	96.0	22	91.7	17	73.9
Logical	f	27	28.7	7	31.8	4	16.0	9	37.5	7	30.4
Confusing	u	14	14.9	4	18.2	6	24.0	2	8.3	2	8.7
Easy	a	53	56.4	11	50.0	14	56.0	15	62.5	13	56.5
Stimulating	f	7	7.4	3	13.6	0	0	2	8.3	2	8.7
Boring	u	52	55.3	10	45.5	20	80.0	12	50.0	10	43.5
Too Elementary	u	43	45.7	8	36.4	15	60.0	9	37.5	11	47.8
Waste of Time	u	31	33.0	6	27.3	12	48.0	6	25.0	7	30.4
Enjoyable	f	6	6.4	4	18.2	0	0	1	4.2	1	4.3
Useful	f	33	35.1	11	50.0	4	16.0	11	45.8	7	30.4
Difficult	a	3	3.2	1	4.5	1	4.0	1	4.2	0	0
Foolish	u	14	14.9	1	4.5	6	24.0	4	16.7	3	13.0
Ambiguous	u	2	2.1	1	4.5	0	0	0	0	1	4.3
Annoying	u	1	1.1	0	0	0	0	0	0	1	4.3
Tiring	u	1	1.1	1	4.5	0	0	0	0	0	0
Insulting	u	1	1.1	0	0	0	0	1	4.2	0	0
Good Idea	f	1	1.1	1	4.5	0	0	0	0	0	0

[a] f = favorable rating
u = unfavorable rating
a = ambivalent rating

(Table continued on next page)

TABLE 37 (continued)

Section E(1.1): Rating of Program

	Treatment Group		Instructor							
	E		1		2		3		4	
Rating[a]	N	%	N	%	N	%	N	%	N	%
Unfavorable	65	69.1	12	54.5	22	88.0	15	62.5	16	69.6
Favorable	17	18.1	8	36.4	1	4.0	5	20.8	3	13.0
Ambivalent	12	12.8	2	9.1	2	8.0	4	16.7	4	17.4

Section E(2): Do you think that this program has helped you improve your writing?

	Treatment Group		Instructor							
	E		1		2		3		4	
Response	N	%	N	%	N	%	N	%	N	%
Yes	23	24.5	8	36.4	3	12.0	9	37.5	3	13.0
No	42	44.7	7	31.8	16	64.0	7	29.2	12	52.2
Don't Know	26	27.7	7	31.8	6	24.0	7	29.2	6	26.1
No Response	3	3.2	0	0	0	0	1	4.2	2	8.7

Section E(3): Do you feel that using "programed instruction" has interfered with the traditional teacher-pupil relationship?

	Treatment Group		Instructor							
	E		1		2		3		4	
Response	N	%	N	%	N	%	N	%	N	%
Yes	38	40.4	8	36.4	14	56.0	9	37.5	7	30.4
No	51	54.3	14	63.6	11	44.0	13	54.2	13	56.5
Don't Know	2	2.1	0	0	0	0	1	4.2	1	4.3
No Response	3	3.2	0	0	0	0	1	4.2	2	8.7

[a] Rating denotes majority of terms checked: favorable (f), unfavorable (u), ambivalent (a).

(Table continued on next page)

TABLE 37 (continued)

Section E(4): In sets No. V-9 and No. V-11 you were given the opportunity to skip several frames ahead. Was this a good idea?

Response	Treatment Group E		Instructor 1		Instructor 2		Instructor 3		Instructor 4	
	N	%	N	%	N	%	N	%	N	%
Yes	84	89.4	21	95.5	23	92.0	21	87.5	19	82.6
No	3	3.2	1	4.5	0	0	0	0	2	8.7
Don't Know	4	4.3	0	0	2	8.0	2	8.3	0	0
No Response	3	3.2	0	0	0	0	1	4.2	2	8.7

Section E(5): Major advantage(s) of this program.

Advantage	N
Learning by repetition is easier	32
Immediate feedback	13
No procrastination in homework	12
Elementary mistakes corrected	9
Independent study	8
No advantages	8
Eliminates teacher	3
More class time	3
Pupils taught on equal basis	2
Increases vocabulary	1
Provides teacher with more time to correct students' work	1
Shows student his weak area	1

(Table continued on next page)

APPENDIX C

TABLE 37 (continued)

Section E(6): Major disadvantage(s) of this program.

Disadvantage	N
Time consuming	35
Too elementary and confusing	21
Uninteresting	18
Too repetitious	16
Eliminated student-teacher relationship	11
Mechanically poor machines	6
No relationship between program and writing of themes	5
Noise in laboratory	3
Pupils able to cheat	3
Too many sets	3
Too specialized	2
Everyone will think the same. Destroys initiative	1
More effort expended than benefits received	1
Pupils do not know work in advance and therefore cannot prepare	1
Should be voluntary	1

(Table continued on next page)

TABLE 37 (continued)

Section E(7): Suggestions for Improvement of Program

Suggestions	N
Raise level of content so it is not so elementary	19
Get foolproof (no breakdown) machines	13
Liven up the presentation with more interesting material	12
Reduce wordiness	9
Reduce repetition	8
Discontinue in college	6
Make point of sets clear ("more logical")	6
Include more branching	4
Lab should be open all day, every day	4
Reduce noise and distractions in lab	3
Make material closer to that given in STEP tests	2
Use for subjects other than English	2
Use on voluntary basis	2
Assign a maximum of 100 frames a week	1
Change format to narrower columns	1
Eliminate reader	1
Eliminate teacher	1
Do not use for English	1
Give grades for work on program	1
Have instructor discuss program in class	1
Include more on sentence structure	1
Student should be allowed to schedule himself	1

(Table continued on next page)

TABLE 37 (continued)

Suggestions	N
Use during class time	1
Use in elementary school	1
Use textbook with machine program	1

Section E(8): Would you like to learn other subjects via Programed Instruction?

Response	Treatment Group E		Instructor 1		Instructor 2		Instructor 3		Instructor 4	
	N	%	N	%	N	%	N	%	N	%
Yes	44	46.8	13	59.1	11	44	9	37.5	11	47.8
No	47	50.0	9	40.9	14	56.0	14	58.3	10	43.5
No Response	3	3.2	0	0	0	0	1	4.2	2	8.7

Section E(8.1): Subjects that students would like to see programed

Subject	N
Natural Sciences	19
Social Sciences	4
Languages	14
Mathematics	21
Business	4

(Table continued on next page)

TABLE 37 (continued)

Section F(1): Factors which may adversely affect the outcome of the study and which students regard as possible sources of difficulty.

Factor	Treatment Group					
	C1		C2		E	
	N	%	N	%	N	%
Cheating while using machines[a]	--	--	--	--	49	52.1
Lack of sufficient contact with readers	37	42.0	45	47.9	49	52.1
Basis for grading themes not made clear	42	47.7	56	59.6	44	46.8
Themes not usually discussed in class	16	18.2	16	17.0	16	17.0
Theme topics not interesting	4	4.5	5	5.3	5	5.3
Theme specs. unclear	2	2.3	8	8.5	5	5.3
Kind of writing required not helpful	0	0	2	2.1	0	0
Too many theme assignments	1	1.1	1	1.1	0	0
Not enough discussion of work in classroom	5	5.7	2	2.1	0	0
Lack of communication between instructor and student	3	3.4	2	2.1	1	1.1
Lack of communication between reader and student	4	4.5	4	4.3	0	0
Cheating in the writing of themes	2	2.3	0	0	0	0
Homework assignments not helpful	0	0	1	1.1	0	0
Personal difficulties not caused by project	0	0	1	1.1	0	0

[a] This factor was tabulated only for experimental subjects.

(Table continued on next page)

TABLE 37 (continued)

Section F(1) continued

Factor	Instructor							
	1		2		3		4	
	N	%	N	%	N	%	N	%
Cheating while using machines	14	63.6	9	36.0	13	54.2	13	56.5
Lack of sufficient contact with readers	32	47.8	40	55.6	21	30.9	38	55.1
Basis for grading themes not made clear	33	49.3	45	62.5	28	41.2	36	52.2
Themes not usually discussed in class	9	13.4	9	12.5	18	26.5	12	17.4
Theme topics not interesting	5	7.5	6	8.3	3	4.4	0	0
Theme specs. unclear	6	9.0	6	8.3	3	4.4	0	0
Kind of writing required not helpful	1	1.5	1	1.4	0	0	0	0
Too many theme assignments	0	0	1	1.4	0	0	1	1.4
Not enough discussion of work in classroom	2	3.0	0	0	3	4.4	2	2.9
Lack of communication between instructor and student	3	4.5	2	2.8	1	1.5	0	0
Lack of communication between reader and student	2	3.0	3	4.2	2	2.9	1	1.4
Cheating in the writing of themes	0	0	1	1.4	1	1.5	0	0
Homework assignments not helpful	1	1.5	0	0	0	0	0	0
Personal difficulties not caused by project	0	0	0	0	0	0	1	1.4

(Table continued on next page)

TABLE 37 (continued)

Section F(2): Suggestions and reccmmendations regarding current study which may improve future studies in programed instruction.

Suggestion and Recommendation	N
Program sets should be less elementary and less repetitious	13
Instructor should have a clear function in the project	8
Students should have more sessions with readers	7
Theme instructions should be clear	6
Student participation in a project should be voluntary	5
Instructors should grade themes instead of readers	3
Theme topics should be of more interest to students	3
Program sets should be shorter and more to the point	2
Readers and instructors should work together more closely	2
Readers should make basis for grading themes clear	2
Students should have a set time assigned for work on machine	2
There should be more contact between student and instructor	2
Traditional classroom teaching should be maintained	2
All material should be ready at beginning of week	1
Cheating should be prevented	1
Labs should be larger	1
Machine breakdowns should be eliminated	1
Programs in subjects other than English should be offered	1
Students should be made to feel that working on the machine is an advantage	1
Student should be tested for subjects he is deficient in	1
Students should be told how they are doing	1
Theme a week helps improve writing	1
Word limit for theme should not be set	1

(Table continued on next page)

TABLE 37 (continued)

Students' Comments on Theme Specifications

Comment	N
Specs. too vague, confusing and constricting	72
Discussion of themes not helpful	13
Discussion of themes not adequate	7
Themes too long	6
Prior class discussion of themes would be helpful	4
Poor example given in specs.	4
Specs. helpful	4
Specs. badly written	3
Grades on themes unfair	1
Required to write too many themes	1
Students criticized for opinions about theme topics	1

Students' Comments on Handbook: Words and Ideas

Comment	N
Exercises were helpful	18
Words and Ideas is a helpful book	18
Exercises not helpful	17
Handbook should be optional - no assignments	12
Words and Ideas not a helpful book	10
Exercises not discussed in class	7
Exercises not related to themes	3

(Table continued on next page)

TABLE 37 (continued)

Students' Comments on Workbook: Introductory College English

Comment	N
Workbook was helpful	18
Workbook was not helpful	11
No discussion of errors in class	8
Too many exercises assigned	1

Students' Comments on Lay Readers

Comment	N
Reader not available often enough or long enough at a time	24
Instructors, not readers, should grade themes	16
Reader helpful	14
Reader not helpful	11
Reader inconsistent in comments and grades	9
Reader too personally severe with student	8
Reader system prevents instructor-student relationship	5
Readers alone, not instructor, should grade theme	3
Reader confused on ideas of assignment	2
Readers corrections not clear	2

TABLE 38

Intercorrelations of the 26 Items Comprising the Study Preference Inventory (N=76)[a]

Item	1	2	3	4	5	6	7	8	9	10	11	12	13
1		23	13	01	-12	-12	01	00	-03	07	-02	01	08
2			24	-07	23	-13	03	13	05	-06	-16	03	00
3				-06	-07	-06	-13	19	18	-02	-15	-02	-01
4					23	04	03	07	10	11	-16	14	06
5						-04	15	05	25	-10	-12	11	-02
6							-30	-01	-27	-04	21	-07	01
7								10	09	-01	04	15	-12
8									17	-11	-08	04	-10
9										03	-26	07	-07
10											16	-05	16
11												01	08
12													03
13													
14													
15													
16													
17													
18													
19													
20													
21													
22													
23													
24													
25													
26													

Note: Decimal places have been omitted.

[a] Based on subjects in Treatment Group E

(Continued on next page)

TABLE 38 (continued)

Item	14	15	16	17	18	19	20	21	22	23	24	25	26
1	14	10	07	18	00	-08	07	11	10	08	-09	-02	-03
2	05	02	16	-11	01	07	20	-26	-10	-13	04	-06	16
3	28	04	15	-15	04	-04	01	-14	00	-08	30	02	-09
4	-06	02	05	-06	17	07	15	03	06	-02	-13	-17	-06
5	-08	-01	12	-09	08	-08	30	-36	05	-03	-04	-30	-14
6	17	-20	05	-03	-01	01	-14	06	06	-08	07	23	16
7	-06	02	10	10	16	-05	14	-10	20	02	-11	-07	05
8	12	00	-09	-15	07	-15	15	-13	24	-09	16	-07	05
9	04	25	10	-07	06	03	30	-11	10	13	14	-38	-14
10	-15	15	08	19	-11	11	08	-10	16	-17	-07	-06	-16
11	12	06	-03	24	-07	-10	-18	-04	-03	-23	23	08	-08
12	-09	-09	04	04	27	-02	42	-08	-06	04	-04	-35	19
13	-02	21	-03	-08	03	05	04	13	-21	-06	09	-22	21
14		02	21	04	14	-14	-11	-05	10	-09	37	15	-09
15			-11	05	-11	19	05	-06	01	11	-02	-33	-05
16				-03	-10	10	12	-19	26	01	11	-02	-02
17					-02	10	01	10	20	01	-17	04	-08
18						-24	28	-13	-08	23	-01	-15	05
19							07	-22	-09	-23	-25	-11	03
20								-13	19	16	-07	-39	-15
21									08	05	-09	10	-02
22										04	-03	-03	-29
23											-08	-06	06
24												13	-04
25													-01
26													

STUDENT QUESTIONNAIRE: PROJECT #1750

We should like to elicit your reactions and comments regarding certain phases of project #1750, Programed Instruction in Freshman English." Please respond frankly. Your answers will in no way affect your grade in Freshman English.

Name ______________________ __Male Code No. __________
Last First Middle __Female
P L E A S E P R I N T

Instructor/Section: Mr. Ackerman __M W F 1; __M W F 3; __T&Th
Miss Bettauer __M W F 1; __M W F 3; __T&Th
Mr. Rubin __M W F 2; __W12 & F12,1; __T&Th
Dr. Swanson __M W F 4; __T12,1&Th1; __T2&Th2,3

A. Theme Specifications

1. Were the theme specifications generally clear?
__yes; __no; __don't know

2. Were the theme specifications generally useful?
__yes; __no; __don't know

3. Were the themes generally discussed in class? __yes; __no

Comments:

B. Handbook: WORDS AND IDEAS

1. Did you use this handbook for regular assignments?
__yes; __no

2. Were the handbook exercises generally useful?
__yes; __no; __don't know

3. Did you use this handbook to help you write your themes?
__yes; __no

4. If you answered "yes" in question No. 3, for how many themes did you use this handbook? _____

Comments:

(Continued on next page)

C. **Workbook:** **INTRODUCTORY COLLEGE ENGLISH**

1. Did you use this workbook? __yes; __no

2. Were the workbook exercises generally useful?
__yes; __no; __don't know

Comments:

D. **Professional Readers**

1. The name of your reader: Mrs. ______(or check: __don't know)

2. How many sessions did you have with your reader? __________

3. How do you feel about meeting with your reader? __like it;
__dislike it; __indifferent

4. Are these sessions generally worthwhile? __yes; __no
__don't know

5. How do you feel about having readers mark your themes?
__like it; __dislike it; __indifferent

Comments:

Section E to be answered only by students who worked on the teaching machines. All other students go on to Section F.

E. **Program:** **THE EXPOSITORY USE OF THE ENGLISH LANGUAGE**

1. Listed below are terms which may describe this program. Check those terms which you feel GENERALLY describe this program.

__interesting
__repetitious
__logical
__confusing
__easy

__stimulating
__boring
__too elementary
__waste of time
__enjoyable

__useful
__difficult
__foolish

additional terms? __________
____
____
____
____

(Continued on next page)

2. Do you think that this program has helped you improve your writing skills? _yes; _no; _don't know

3. Do you feel that using "programed instruction" (e.g. teaching machines) has interfered with the tradtional teacher-pupil relationship? _yes; _no; _don't know

4. In sets No. V-9 and No. V-11 you were given the opportunity to skip several frames ahead. Was this a good idea?
_yes; _no; _don't know

5. What is (are) the major advantage(s) of this program? (Use other side for additional space)

6. What is (are) the major disadvantage(s) of this program? (Use other side for additional space)

7. How can this program be improved? (Use other side for additional space)

8. Would you like to learn other subjects via "programed instruction"? _yes; _no
If "yes", which other subjects? ________________________

Comments:

(Continued on next page)

F. Research Project #1750

1. Probably several uncontrolled factors may adversely affect the outcome of this study. Several of these are listed below. Check those factors which you regard as possible sources of difficulty and add others.

   __cheating while using the teaching machines

   __lack of sufficient contact with readers

   __basis for grading themes was not made clear

   __themes were not usually discussed in class

   ____

   ____

   ____

2. What suggestions and recommendations can you offer regarding this current study which may improve future studies in "programed instruction"?

THANK YOU FOR YOUR COOPERATION

APPENDIX F

STUDY PREFERENCE INVENTORY: PROJECT #1750

The purpose of this questionnaire is to aid in determining which method of teaching benefits the individual student most.

Your identity is kept confidential and the information supplied is to be used only for research purposes.

The study will be meaningful if you will give it your close attention and will respond with complete sincerity.

Directions:

Please indicate for each pair of items which is true for you. There are no right or wrong answers. If you find that you disagree with both statements, choose the one you disagree with less. If both statements are true for you, choose the one that is more true.

Place a circle around A or B of each pair of statements to indicate your choice. For example:

A Prefer to study by myself.

B Prefer to study with a friend

Which is true for you?
Or, which is more true for you?
Circle A or B.

(Continued on next page)

APPENDIX F

Code No.__________

1 A*I prefer a course in which the lecture is predominant.

B I prefer a course in which classroom discussion is predominant.

2 A*I tend to do my homework in one subject before proceeding to the next, even if it is boring.

B I tend to put aside homework in one subject, if it is boring, and turn to another subject.

3 A I like to know how I am proceeding in relationship to the class.

B*I like to work without knowing how others are proceeding.

4 A I feel that somehow I always get the homework done in each subject.

B*I feel an urgency to do all the homework in each subject.

5 A*I tend to work at a task until I know it is all correctly done.

B I tend to stop working on a task when I'm having difficulty and start fresh at another time.

6 A*I like to proceed at my own rate.

B I like to proceed at the same rate as others.

7 A I tend to use methods I am familiar with.

B*I tend to try new methods of studying.

8 A When I have difficulty answering a question, I prefer to skip it for the time being and go on to the next.

B*When I have difficulty answering a question, I prefer to have the answer available at once.

9 A*I tend to master one step before proceeding to the next.

B I tend to learn the complete task and then go back to see which areas I need to review.

(Continued on next page)

10 A*I usually complete my homework in each subject regardless of the time it takes.

B I usually allow a given period of time for each subject.

11 A I prefer to know how I made out after completing the task.

B*I prefer to know where I stand as I complete each stage of a task.

12 A I tend to skip over an item I don't understand or have difficulty with.

B*I tend to go over an item I have difficulty with until I understand it, or know it, before proceeding.

13 A*I prefer to work on a problem by myself.

B I prefer to work on a problem with the class.

14 A*When having difficulty with an item, I keep reviewing it.

B When having difficulty with an item, I look ahead in the text for clues.

15 A I prefer to work under teacher supervision.

B*I prefer to work on my own.

16 A I tend to look at questions which lie ahead.

B*I tend to work on the question at hand before proceeding.

17 A*I prefer to know whether my work is correct or incorrect at each step, as I work on a problem.

B I prefer to know whether I am correct or incorrect after completing the problem.

18 A*I prefer a prescribed procedure of doing my homework.

B I prefer to use procedures of my choice in doing my homework.

19 A I tend to study with a friend or in a group.

B*I tend to study by myself.

(Continued on next page)

20 A I tend to do that part of the homework which I understand and save the rest for classroom clarification.

B*I tend to do my homework, working out each item in order, no matter how difficult.

21 A*I prefer to be told whether my work is correct or incorrect privately.

B I prefer to have the teacher mention whether my work is correct or incorrect as part of classroom procedure.

22 A*I tend to proceed only when I am sure that each step is correct.

B I tend to go back over my homework to make corrections.

23 A I prefer to take a course in a classroom.

B*I prefer to take a course through the media of TV or tape recordings.

24 A I tend to look over my work first and then proceed.

B*I tend to study one step at a time.

25 A I tend to figure things out for myself.

B*I tend to have things explained to me.

26 A My study habits change with each subject.

B*My study habits are pretty much the same for each subject.

Note: * denotes alternative which is akin to programed instruction and use of teaching machines.

3

Test on the Program "The Expository Use of the English Language"
Form A: Project #1750

Record your answers on the answer sheet. Do not mark up the test booklet.

1. (Three answers are required)

   The effective operation of any symbol depends on three essential conditions:

   The users of the symbol must _____ on what the symbol ___ and on the ____ in which they intend to use it.

2. If two or more symbols are to be used within a system of symbols, it is further necessary for the users of the system to understand the ____ for associating individual symbols to make larger expressions.

3. When a word (such as "bridge" for example) can designate any of several things, the ____ in which the word appears determines which of these things is being designated.

4. I usually like the poems of John Keats, but I do not care for Lamia.

   Copy each proper noun in the sentence above.

5. Early Beethoven often sounds like Mozart.

   "Beethoven" and "Mozart" in the sentence above illustrate an extended use of proper nouns called _____.

6. Finley has been painting for years, but in my opinion he will never be a Rembrandt.

   The use of "Rembrandt" in the sentence above is an example of the use of a proper noun as a _____.

7. A noun (such as "woman," "man," for example) that names a set of characteristics shared by all instances of whatever the noun names is called a(n) _____ noun.

8. (Two answers are required)

   John Keats was a poet.

   In the sentence above, "John Keats" is a ____ noun; "poet" is a _____ noun.

9. If one man with one shovel worked hard, he could soon remove a great quantity of debris.

   Copy each underlined noun in the sentence above that names a distinct unit each of which can be counted.

(Continued on next page)

10. The author treats the topic with a certain degree of enthusiasm. The clarity of his argument is admirable.

In the sentences above, copy each of the underlined nouns that do not name things that are distinct units each of which is called "A-whatever-it-is," and which cannot be changed to the plural and preceded by a number to mean "so-many-units."

11. 1. My dogs are excellent hunters.
2. Dogs are man's best friend.
3. I am allergic to dogs.

a) In sentence(s) * * *, "dogs" names a number of animals with the defining characteristics represented by the noun "dogs."
b) In sentence(s) * * *, "dogs" names any animal that exhibits the defining characteristics represented by the noun "dogs."

12. a) "Dalmation" is (more/less) specific than "dog."
b) "Animal" is (more/less) specific than "dog."

13. When two nouns are used as names for the same kind of thing (such as "mineral," "quartz" for example), the noun that names all the defining characteristics represented by the other plus some additional ones is the more (specific/general) noun.

14. a) The more general the noun, the (greater/smaller) the number of instances that can be found of what the noun names.
b) The more specific the noun, the (greater/smaller) the number of instances that can be found of what the noun names.

15. mankind, man, manhood, manliness

Copy each concrete common noun in the underlined list above.

16. tree, plant, willow

Copy the noun from the list above that allows the reader to form the most distinct image of what is named.

17. Regularly the noun "thing" in English is used to represent whatever has one or more _____ characteristics.

18. The tears in the White Knight's eyes at the thought of a
a b c
pudding made of blotting paper, gunpowder, and sealing-wax
d e f g
were a moving indication of his capacity for emotion.
h i k

Copy the letter beneath each abstract noun among the underlined words in the sentence above.

(Continued on next page)

19. NOUN DEFINITION

NOUN	DEFINITION
snare	1. Primary designation: A kind of trap for small animals, usually consisting of a noose which jerks tight upon the release of a spring trigger. 2. Metaphorical extension: Anything dangerous, risky, etc. that tempts or attracts.

She was beautiful but cruel, and so for many an unsuspecting man, her beauty proved a snare.

In the sentence above, "snare" is being used as a(n) _____.

20. a) The judges of Venice would have found Othello guilty of murder.
b) Othello judges Desdemona guilty on circumstantial evidence.

In sentence a), "judges" functions as a(n) _____.
In sentence b), "judges" functions as a(n) _____.

21. (Two answers are required for a) and b)

a) man -- an adult male
b) man -- to supply with men, as for service

a) "Man" in dictionary entry a) is a _____; that is, it represents the characteristics shared by certain _______.
b) "Man" in dictionary entry b) is a _____; that is, it represents certain characteristics that can be used to make a(n) _____.

22. (Two answers are required)

a) Single-word verbs in the present tense have _____ form(s).
b) Single-word verbs in the past tense have _____ form(s).

23. a. Friction produces heat.
b. This student seems happy.
c. Men are but children of a larger growth. (-- John Dryden)
d. These animals seem hungry.

Copy the verb of each sentence in which the assertion is limited to the time the statement is being made.

24. (Two answers are required)

Mr. Califadge is going to France next summer.

In the sentence above, the verb phrase has a ____ ____ form; the time indicated by the sentence is _____.

25. (Five answers are required)

Identify each of the following verb forms as V, Vs, or Vd.

freezes, laid, tears, did, lie

(Continued on next page)

26. Copy each of the following verbs that might be either Vd or V forms depending on the context:

    walked, burst, tore, cut, sang, hit

27. (Two answers are required)

    Boroughs, city, five, is, Manhattan, of, one, York

    The word "new" would be added to the list above between _____ and _____.

28. (Two answers are required)

    a. Sturdley ties packages.
    b. Sturdley packages ties.

    The information that each sentence above gives depends on which word is in the _____ position and which word is in the _____ position.

29. An army marches on its stomach. (--Napoleon)

    In the sentence above, the present-tense verb form "marches" is determined by _____.

30. The number of the subject noun determines the ending of the present-tense form of the verb in a subject-verb-object sequence according to a principle of English grammar called____.

Answers

1. agree; represents; context
2. procedures
3. context
4. John Keats; Lamia
5. metonymy
6. metaphor
7. common
8. proper; common
9. man; shovel
10. enthusiasm; clarity
11. 1; 2,3
12. more; less
13. specific
14. greater; smaller
15. man
16. willow
17. physical
18. c;h;i;k
19. metaphor
20. noun; verb
21. noun; people
    verb; assertion
22. two (OR 2)
    one (OR 1)
23. seems; seem
24. present tense; future
25. Vs;Vd;Vs;Vd;V
26. burst; cut; hit
27. Manhattan; of
28. verb; object
    (either order)
29. army
30. agreement

APPENDIX H

Test on the Guth's Handbook WORDS AND IDEAS
Form A: Project #1750

This test is based on Guth's Handbook WORDS AND IDEAS. Select the one alternative which correctly completes the statement in terms of this handbook.

Your score will be the number of questions answered correctly. There is no penalty for guessing.

Place your answers on the IBM answer sheet.

1. A thoughtful writer will:
   1. be concerned with the reader's interest
   *2. recognize and define difficult words he has used
   3. use simple construction
   4. avoid repetition

2. If an author uses the word "intellectual" in abstract writing, he should:
   *1. describe intellectuals he knows
   2. expect the reader to use his own definitions
   3. depend on the general usage of the word
   4. formulate a loose definition

3. When the writer first tries to communicate feelings and sensations he will find that words:
   1. adequately express his feelings
   *2. are a poor substitute for first-hand experience
   3. are hard to find
   4. are difficult to apply

4. The inexperienced writer learns to transmit his impressions clearly and without distortion by:
   1. copying the techniques of others
   2. avoiding purple passages
   3. increasing his vocabulary
   *4. constant effort

5. The writer who communicates his observations and reactions by generalized labels shows that he uses words:
   *1. as all-purpose symbols
   2. as symbols of authority
   3. to reach the general public
   4. to influence his readers

(Continued on next page)

6. A writer who tries to make his descriptions vivid, as well as concrete, often prefers details which are:

    1. predictable
    2. stable
    *3. dynamic
    4. easy to understand

7. Effective description of a person requires careful observation of:

    1. the person's character
    *2. the physical person
    3. what others say of the person
    4. your feelings about the person

8. Figurative expressions make use of:

    *1. similarities between different things or ideas
    2. differences between similar things or ideas
    3. agreement between writer and reader
    4. fantasy and make-believe

9. Every day speech is full of:

    1. colloquial expressions
    *2. metaphorical expressions
    3. figures of speech
    4. similes

10. The expression "do not put all your eggs in one basket" is called a:

    1. literal expression
    2. colloquial expression
    *3. metaphorical expression
    4. figure of speech

11. Phrases like "Mother Nature," "Father Time," "the crack of dawn" are considered:

    1. euphemisms
    2. similes
    3. platitudes
    *4. trite metaphors

12. You can sharpen your powers of descriptive writing by:

    1. making greater use of your imagination
    *2. conscientious practice
    3. reading diversified material
    4. improving your vocabulary

(Continued on next page)

13. Descriptive writing will increase your ability to use:

    *1. discrimination
    2. accurate observations
    3. differentiated observations
    4. words with multiple meanings

14. The essential characteristics of a competent writer's work are:

    1. accurate observations and discriminating selection of details
    2. clear organization of thoughts and material
    3. graphic and expressive language
    *4. all of the above

15. Obtaining consensus on the definition of a word such as "liberty" is:

    *1. difficult
    2. desirable
    3. impossible
    4. useless

16. Careful investigation of what we wish to write about is necessary if we wish to:

    1. be specific
    *2. arrive at definitions that will work
    3. write accurately
    4. write clearly

17. Like other general statements, definitions often need the support of:

    1. other definitions
    2. observations
    3. intuitive thinking
    *4. examples

18. Comparing and contrasting closely related terms requires the use of:

    1. supporting generalizations
    2. metaphors
    *3. exact definitions
    4. clear and accurate descriptions

19. If your writing expresses approval or disapproval, praise or blame, your reader will feel entitled to:

    1. a limited and specific explanation
    *2. a clear and precise statement of your standards
    3. question your information
    4. authoritative support of your assertions

(Continued on next page)

20. Words like "propaganda." "rationalization," "unrealistic," if not defined, will make your writing sound:

    *1. opinionated
    2. incredible
    3. emotional
    4. objective

21. Words like "good," "fair," "wholesome," "inspiring" often mean little until we can determine the author's:

    1. social position
    2. opinions
    *3. standards
    4. generalizations

22. The ambiguity of undefined value judgments is most obvious in the field of:

    1. technical writing
    2. scientific work
    3. classroom instruction
    *4. entertainment and art

23. The first step toward making sound and meaningful generalizations is to anchor them firmly to:

    1. daily observations
    2. the metaphor of the language
    *3. the first-hand experience from which they derive
    4. elaborate explanations of the generalization

24. Many students write papers on such a high level of abstraction that they find difficulty in:

    1. developing higher levels of abstractions
    *2. ever becoming concrete
    3. using different levels of abstractions
    4. being understood

25. An indispensable aid to effective and fool proof communication is the use of:

    *1. concrete examples
    2. descriptive matter
    3. logical explanations
    4. a direct point of view

26. When a writer acts as if the authority of his statements cannot be challenged, he usually fails to give an accounting of:

    1. the reason for his observation
    2. his objectives
    *3. the source of his ideas
    4. his standards

(Continued on next page)

27. Writing that caters to readers' tastes, preferences and susceptibilities is called:

    *1. persuasive writing
    2. descriptive writing
    3. expositional writing
    4. narrative writing

28. Techniques of persuasion that rely on ignorance or gullibility are most likely to offend:

    1. the subjective reader
    2. the indiscriminate reader
    3. the college student
    *4. the intelligent or informed reader

29. The tendency to exaggerate is:

    1. more prevalent in the uneducated
    2. more prevalent in emotional people
    *3. fairly universal
    4. common in women

30. A statement which asserts -- "The Mayor's program for urban reconstruction is diametrically opposed to the best interests of the business community" is called:

    1. a balanced statement
    *2. an exaggerated statement
    3. a parallelism
    4. a correlative

31. Exaggerations are most effective in persuading people who are:

    1. subjective readers
    2. receptive readers
    3. dull readers
    *4. uncritical readers

32. Like exaggeration, slanting ceases to persuade as soon as it becomes:

    *1. obvious
    2. offensive
    3. personal
    4. unclear

33. Advertisers and propagandists often employ strategic ambiguity:

    1. as persuasive devices
    *2. as deliberate deception
    3. to gain the attention of readers
    4. because they believe in their message so strongly

(Continued on next page)

34. In order for a reader to question a writer's conclusions and judgments, they must be:

 1. implicit
*2. explicitly stated
 3. graphically described
 4. logically organized

35. An alert reader would recognize such modifiers as "merely," "finally," "great," "notorious," "biased," "honest," or "wholesome" as:

 1. connotative language
 2. ambiguous language
 3. persuasive language
*4. emotive language

36. In a field like politics where attitudes differ widely the power of words to suggest varying attitudes with a minimum of explicit statement is:

*1. most obvious
 2. most useful
 3. most desirable
 4. most often exploited

37. The objective meaning of a word is often called its:

 1. true meaning
 2. connotation
*3. denotation
 4. meaning in experience

38. The untrained reader mistakes for factual classification many words that have:

 1. colloquial usage
*2. emotive coloring
 3. figurative usage
 4. subjective emphasis

39. Many journalists and public figures habitually use:

 1. a mixture of vocabularies
 2. as many vocabularies as are needed
 3. three vocabularies
*4. two distinct vocabularies

40. Emotionally weighted words can cause troubles by being more unstable and more unpredictable than their:

*1. denotations
 2. connotations
 3. implications
 4. definitions

(Continued on next page)

41. You can often keep a discussion focused on the issues at stake by replacing complimentary or derogatory words with:

 1. denotative terms
*2. neutral terms
 3. factual terms
 4. descriptive terms

42. In trying to bolster your own ideas, you should use references to authorities, not as evidence that your ideas are true, but as evidence that your ideas are:

 1. not to be taken lightly
 2. to be carefully analyzed
*3. worthy of consideration
.4. worthy of lots of attention

43. Writers trying to avoid explicit assertion are fond of rhetorical questions, i.e. questions that:

 1. point to their answers
 2. suggest answers but have no answers
 3. are also answers
*4. have built-in answers

44. Many familiar techniques of persuasion have overtones of:

 1. hypocrisy
 2. exaggeration
*3. deception
 4. ambiguity

45. To produce writing that is both persuasive and responsible and that does not alienate critical readers, it is necessary to:

*1. write with clarity and moderation
 2. use observations and diagrams
 3. write with detail and attention
 4. be rhetorical and descriptive

46. Effective persuasion, like other aspects of effective writing, is as much a result of practice and experiment as it is of following:

 1. the rules of composition
 2. one's strongest inclinations
 3. one's most recognizable observations
*4. a set of specific instructions

47. "Order of division" is the general term for a kind of organization in a piece of writing arrived at by:

 1. comparison and contrast
*2. classification and analysis
 3. analogy and illustration
 4. deduction and induction

(Continued on next page)

48. Inductive order is especially effective when a writer has to overcome:

1. evidence or reasons
2. persuasion or propaganda
3. argument or analysis
*4. prejudice or distrust

49. An inexperienced writer often does well to give first:

1. an opinion and then the authorities who support it
2. an illustration and then evidence to support it
*3. a conclusion and then evidence to support it
4. an abstract statement and then concrete details to support it

50. Part of your job, as a reader, is to separate:

*1. fact from rhetoric
2. false information from true information
3. examples from definitions
4. persuasion from argument

Note: * denotes the correct alternative.

APPENDIX I

SELECTED BIBLIOGRAPHY OF SOURCES FOR THE PROGRAM

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APPENDIX J

IMPROMPTU THEMES

The format for impromptu themes No. 4 and No. 6 represent typical categories and directions to students used in all of the common theme specifications in this study. Themes to be written outside of classroom-controlled conditions often included suggested readings in the handbook, and sometimes included illustrative paragraphs with the minimum specifications as additional guides for the student.

Theme No. 4

Length: 250 words (approximately)

Object: To describe in concrete terms something you remember for a reader who has not seen what you are describing.

Subject: Choose one (1) only of the following:

(1) Describe an object you remember.

(2) Describe a person you remember.

(3) Describe a place you remember.

Treatment:

1. Choose one (1) only of the subjects listed above.
2. Pick a subject you can do justice to in 45 minutes.
3. Write more than one paragraph.
4. Include a topic sentence in each paragraph.

Requirements:

Your piece of writing

1. must be specifically descriptive; that is, your reader should be able to recognize the person or place or object you describe if he should ever happen to see them, and
2. must be rhetorically effective and grammatically accurate.

(continued on next page)

APPENDIX J

Theme No. 6

Length: 250 - 300 words

Object: To propose a course of action, and to support the proposal with a recommended procedure for carrying it out.

Subject: Choose one (1) only of the following:

(1) A proposal and recommendation for fraternities and sororities on campus at Fairleigh Dickinson University

(2) A proposal and recommendation for maintaining drag strips for stock car races at the expense of Bergen County.

(3) A proposal and recommendation for summer student tours of a European city. (NOTE: You specify the city)

Treatment:

1. Choose one (1) of the subjects listed above.
2. Write more than one paragraph.
3. Include a topic sentence in each paragraph.
4. Divide your piece of writing so that the first part describes in detail the course of action you are proposing, and so that the second part offers a detailed set of supporting recommendations for carrying out the proposed course of action.

Requirements:

Your piece of writing

1. must be expository; that is, it must give the necessary information;
2. must be organized so that the proposal comes first, followed by the recommendations;
3. must be developed analytically; that is, must begin with a general statement and proceed to specific details of support;
4. must be logically, rhetorically, and grammatically sound.